ENGINEERING NEWS-RECORD

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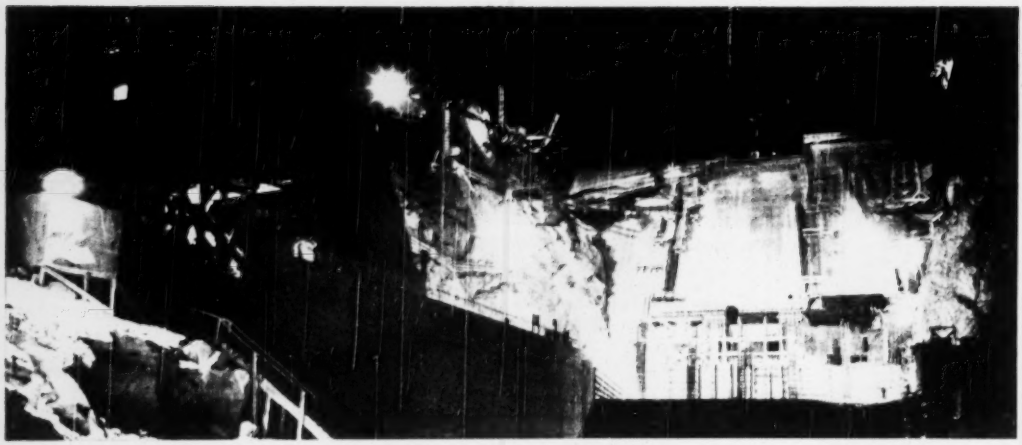
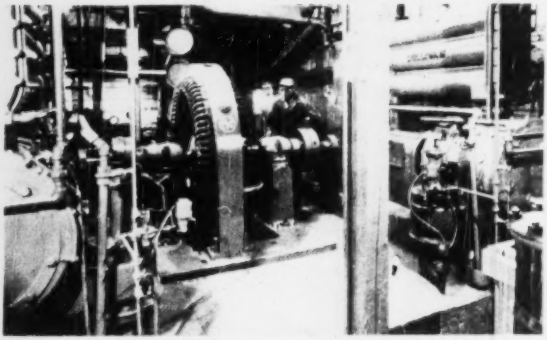
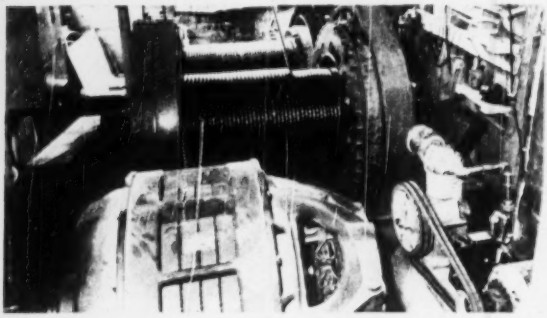


speeding construction at Kortes Dam

... Electrically



All air pressure for job comes from compressors driven by a 500-hp G-E motor



The 185-foot boom hoist is driven by a 200-hp General Electric induction motor

G-E Equipment Operates Around the Clock to Meet Schedule

To maintain their rigorous work schedule at the Bureau of Reclamation's Missouri Basin Kortes Dam project, Kortes, Wyoming, Morrison-Knudsen Co., contractors, must keep on the job 24 hours a day. Thanks to modern machinery *electrified by General Electric*, work proceeds at this accelerated pace without the periodic shutdowns usually expected in this kind of job.

When you electrify with G-E motors and control supplied from G-E power-distribution systems, you get safer, faster, more efficient operation. You'll also have the added advantage of engineering assistance in application, installation, and service — regardless of job location. *[illegible] Dept., General Electric Co., Schenectady 5, N. Y.*

Whether you buy or build construction equipment, your G-E representative can show you how to do a better job — at lower cost — by complete electrification. Write him now, and he'll call on you at your convenience.

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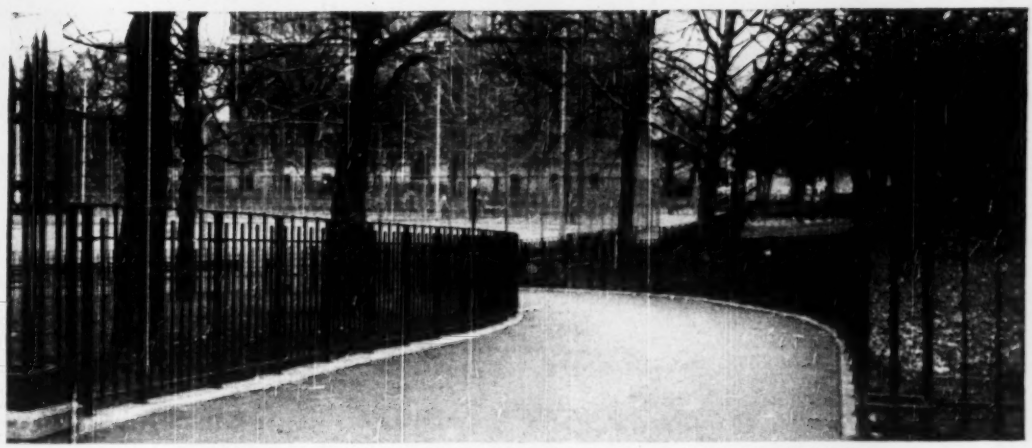

Mayari R fence in Rigo Park along the Brooklyn-Queens connecting Highway, Queens, Long Island, N. Y.

Park and Highway Fences

Built of Corrosion-Resisting MAYARI R

There are two sound reasons why the use of Mayari R bars in ornamental or park fence is increasing. Both reasons are closely related and both have a direct bearing on economy.

1. Mayari R has excellent resistance to atmospheric corrosion. Independent tests show that this grade of steel has 5 to 6 times the corrosion-resistance of plain carbon steel, and 2 to 4 times that of copper-bearing steel. Fences built of Mayari R can be expected to give considerably longer service than those made of ordinary materials.

2. Paint lasts 20 to 80 percent longer on Mayari R than on plain carbon steel, depending on the type of paint used. This obviously means a savings in paint maintenance for fences built of this superior grade of steel.

Further information on versatile, economical Mayari R is readily available. Write or phone for a copy of Catalog 259.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

Fence of Mayari R being installed along a waterfront park in Richmond Terrace, Staten Island, N. Y.

Linden Park, Roosevelt Ave., Flushing, Long Island, N. Y., has a fence of Mayari R.

★ BETHLEHEM STEEL ★

Mayari R *makes it lighter... stronger... longer lasting*

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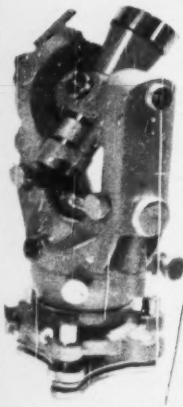

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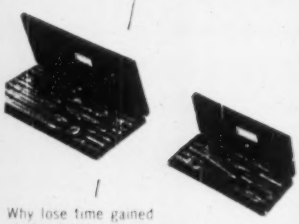

Why lose time gained at the drawing board. WILD DRAWING INSTRUMENTS are of the same precision workmanship as WILD Theodolites and Levels. Made of stainless steel, WILD stands for accuracy, speed and, above all, positive assurance of highest precision.

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ENGINEERING NEWS-RECORD

Volume 144 · JUNE 15, 1950 · No. 24

WALDO G. BOWMAN
Editor

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To the men who build

Eliminating Deep Pockets of Concrete Between Joists IS Important

NAILING top lath to Macomber V Bar Joists saves time, labor and material. Competitive conditions today make these savings worthy of careful investigation.

When top lath is nailed into the steel top chord of the V Joist by driving a staple or roofing nail over the rib or mesh, a solid anchorage is the result.

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FOR SPANS 4 TO 40 FEET
MACOMBER NAILABLE
V BAR JOISTS
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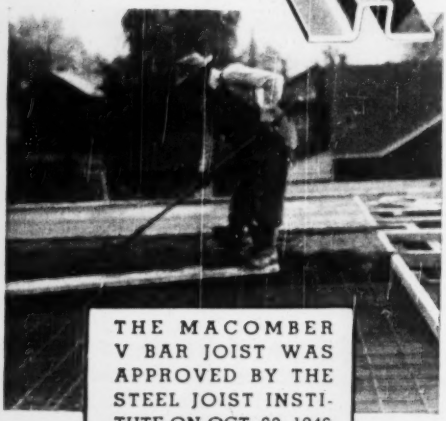

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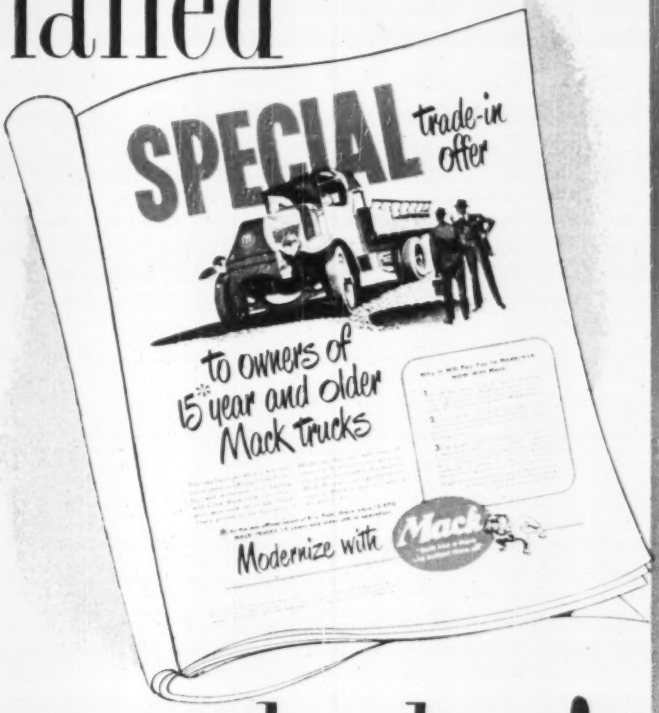

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Proving that Mack trucks outlast them all!

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Thanks—but no! "Our fleet comprises 235 motor vehicles and includes 136 Macks, several of which have passed the fifteen-year mark . . . one is in its twenty-fifth year. All are registered and operating profitably. We can see no reason to retire such trucks at this time." C. W. HALL, PRESIDENT, C. E. HALE & SONS, SOMERVILLE, MASS.

Not trading! "My 1925 Mack still does its share to gross me $5,000 per year in the moving business—and I have spent less than $100 in repairs on this truck in the last 20 years. Obviously, I am not interested in trading." E. V. ASHBY, ASHBY HOUSE MOVING CO., OKLAHOMA CITY.

Will keep! "Our 1934 Mack is still giving good service—it is the oldest of our 50 Macks but still good enough to keep." CLARENCE E. SMITH, SMITH BROS. TRUCK CO., LOS ANGELES, CALIFORNIA.

Still too good! "With reference to your proposal to give us an extra allowance on our Bulldog Mack purchased in 1922—please be advised that this truck is too good to trade in." J. KOLKO, SPEEDWAY WRECKING CO., CHICAGO, ILL.

Trade? not yet! "Forty-two of our trucks are Macks—some of them 27 years old. They outlast any other make and have proved very economical to operate. Not trading yet." JOSEPH CAPECCI, PHILADELPHIA, PENNA.

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Profit is determined by *handling costs per yard*, and here are 2 important reasons why you can lower those handling costs with AMSCO Dippers:

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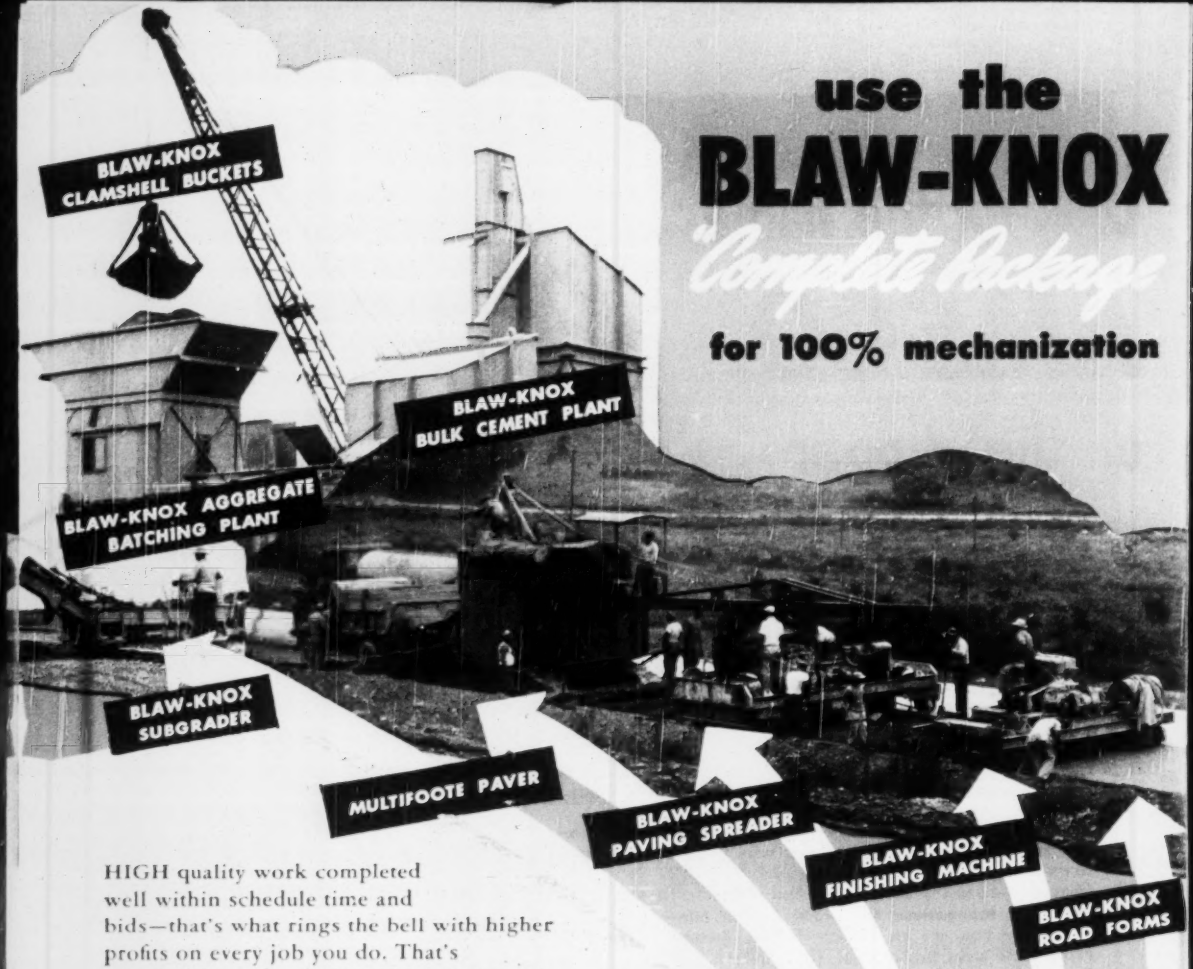

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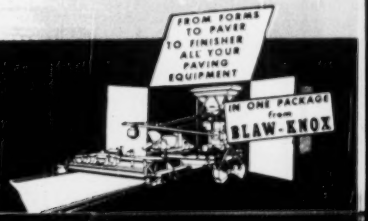

NEWS BRIEFS

Are You A Contractor?—Arizona's attorney general says you are, maybe, if you sell a raw material such as sand or gravel. If you quote a price for material plus installation, then hire a licensed contractor, you qualify as a contractor under the ruling.

It Takes Two—The Teamsters Union (AFL) has been warned by the National Labor Relations Board that it can't legally sign up an employer's only truck driver, then force the company to bargain collectively on his behalf. It takes two workers to bargain collectively, NLRB says.

Tourist Promotion?—Passenger cars crossing the Golden Gate Bridge in San Francisco will pay only 40¢ instead of 50¢ after June 30. Biggest opposition came from those who wanted a break for commuters. New York's Port Authority favored the latter last week by halving the cost (to $10) of a 40-trip ticket good for one month.

Let (Uncle) Sam Do It—Stuart A. Cordiff, California Electric Power Co. engineer who conducted first commercial application of cloud nucleation as a power resource development (ENR March 2, p. 35), wants the federal government to regulate rainmaking. He says there's no doubt that man can control rainfall, but that this raises legal problems which require federal licensing, research and qualification of rainmakers.

Think You Have Troubles?—J. A. R. Cardinal, of Montreal, charged with failure to repair a chimney, pleaded that the 175-year-old building is so unstable he can't get workmen to go into its roof, can't get insurance either. He adds that the law refused him permission to evict tenants so he could demolish the structure.

Economy Note—Army Engineers are closing their 50-year-old Tampa sub-office as an economy move, transferring its functions to Jacksonville. Seven employees may transfer elsewhere to Army offices.

How Can You Tell?—L. H. McGraw & Co., constructors, claims an industry advertising "first" with its new wallet-size card, summarizing Daylight and Standard Time information for important cities, all states and Canada. (Free by writing R. F. Kane, L. H. McGraw & Co., 51 E. 42nd St., New

(Continued on page 10)

"We've proved that it's good business to replace old sash with modern

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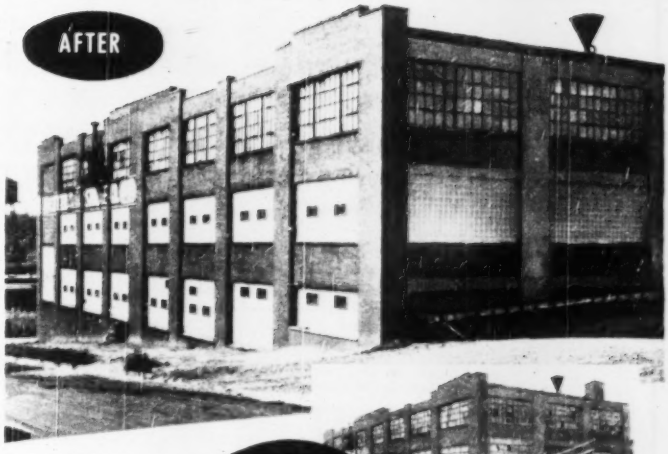
When seven worn-out, rotted or decrepit sash has been replaced with modern PC Glass Blocks, executives in all kinds of plants have been rewarded with tangible operating benefits and actual money savings. And more often than not, they report that PC Glass Block installations have eventually paid for themselves through the economies they've made possible.

Such performance is not surprising. For PC Glass Blocks have inherent features which effect definite economies and improvements. For example, they rarely need repairs or replacements. They have more than twice the insulating value of ordinary single-glazed windows, thus reducing heating and air conditioning costs. They ... solve no periodic painting and puttying; eliminate the expensive cleaning of small, individual panes. What's more, they prevent the infiltration of dust and grit, dampen outside noises, cut out distracting views. And they admit plenty of diffused natural daylight over wide working areas, relieving eye fatigue and increasing employee efficiency. This is especially true with the PC *Functional* Glass Blocks having the new, exclusive PC Soft-Line® Edge Treatment.

You'll find it to your advantage to learn what PC Glass Blocks can do in your buildings. Why not consult with our specialists about a practical program of sash replacement? Meanwhile, fill in and return the coupon for further information.



SASH REPLACEMENT programs are readily adaptable to budgets. The entire job can be done at once or extended over long periods. These photographs are "before and after" proof of the effectiveness of PC Glass Blocks in replacing old sash. Lawson Milk Company, Cuyahoga Falls, Ohio.

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CLEVELAND • BOSTON • NEW LONDON • PASADENA, TEXAS

(Continued from page 9)

York City. Card doesn't say whether Daylight is ahead of, or behind Standard Time.

Pretty, Please—Boston's Planning Board has warned Public Works Commissioner Callahan to "dress up" his proposed overhead arterial highway, if he wants board approval of it. The proposed structure, the board says, would impair values of adjacent property.

Just in Case—The Montana Federation of Labor and three local unions may intervene if Montana's district court ever holds a hearing on a case that's been dragging since last summer. It involves the state's right to award a street paving contract to the second low bidder because the low bidder had been having labor trouble.

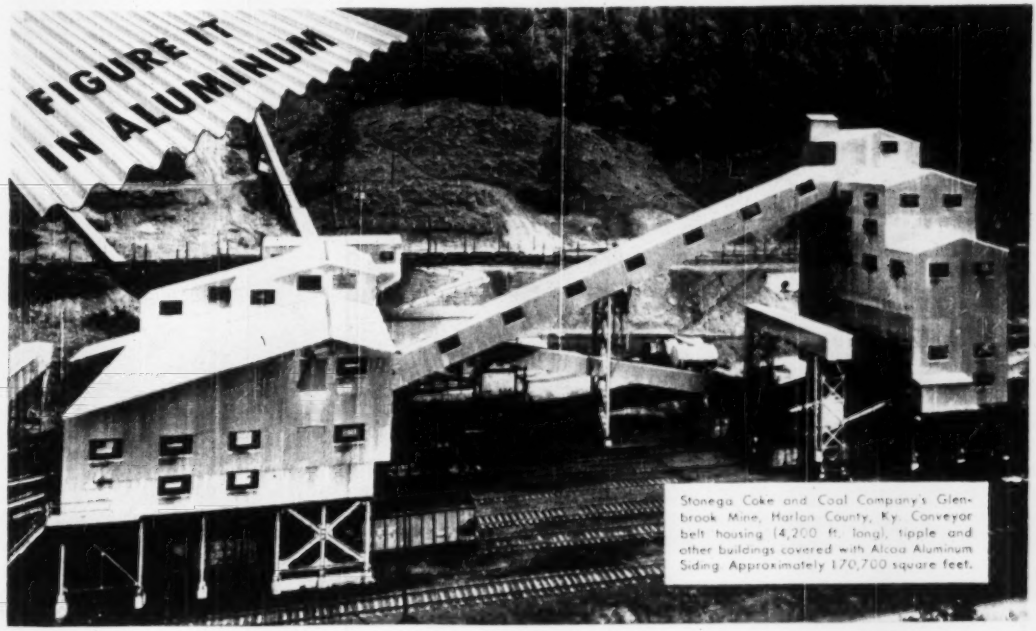
UMW Journal, Please Copy—Chicago is studying comparative costs of using gas or oil instead of coal in municipal pumping stations and power plants. Coal cost $2.87 per ton in 1938, peaked at $7.50 in 1948 and came in at $6.76 on a bid for a temporary supply this year.

Not All Rural—North Carolina's preoccupation with its $200 million rural road program didn't divert all attention from main roads. Gov. Scott Kerr has okd'd an $8,000,000 allocation from surplus funds for what he termed the eight most critically needed primary road projects in the state.

Steady Tenants at Last—Once the world's largest factory, the Dodge airplane engine plant in Chicago will be converted into a federal office center. Early attempts to dispose of the government-built, $171 million, 5,000,000-sq ft structure caused a tumult between Tucker Corp., whose automobile never got into production, and Preston Corp., whose prefab home never got into use. Tucker got it, but the U. S. still has it.

Just Like a Drill—Carl Gauthier, of Akron's sewer division, got the city's largest suggestion award, $100, for a suggestion that will save $2,632 yearly in sewer cleaning costs. It involves permanent supports in manholes to support cables which will pull cleaning apparatus from manhole to manhole. Timber "trusswork" won't have to be erected each time but it's

Stitch in Time Dept.—Buffalo, N. Y., district of the Corps of Engineers is going to play tough with people who release oil into the Buffalo River. Corps points out that it wants no unnecessary threat to navigation.



Stonega Coke and Coal Company's Glenbrook Mine, Harlan County, Ky. Conveyor belt housing (4,200 ft. long), tipple and other buildings covered with Alcoa Aluminum Siding. Approximately 170,700 square feet.

Put up more siding per man-hour

Roofing and siding goes on faster when you use Alcoa Industrial Building Sheet. It is light in weight (only 56 lbs. per square), easy to cut and form, and needs no protective painting. Figure your next job in aluminum. See how it saves you not only on material costs, but in time and erection costs, too.

Alcoa Aluminum Building Sheet is conveniently available, together with a complete line of fasteners and accessories for easy assembly. For application and engineering details, call your nearby Alcoa sales office, listed under "Aluminum" in your Classified Telephone Directory, or mail the coupon at right.

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Alcoa Industrial Building Sheet may be erected over steel or wood purlins or girts. It may be fastened by nails, purlin nails, straps, clips, screws or weldable studs.

Lengths: 5 to 12 feet. Widths: Roofing, 35 inches; Siding, 33⅓ inches. Thickness: .032 inches—equal to 21 U. S. Gauge.

Available for prompt shipment with all types of fasteners and flat and preformed flashing.

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for the first time ever—built from the ground up!

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- **For the first time—a complete sub-tread, bracing and locking every lug, with firm, full-chain lug action . . . with master traction in *all* ground, under *all* loads.**
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- **For the first time ever — a super-tough deep-treaded tire . . . master of cut, crack and chip.**
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- **For the first time ever—a load-molded tire . . . built round . . . mounts round . . . fits modern rims, reduces stress and strain on the tire body.**

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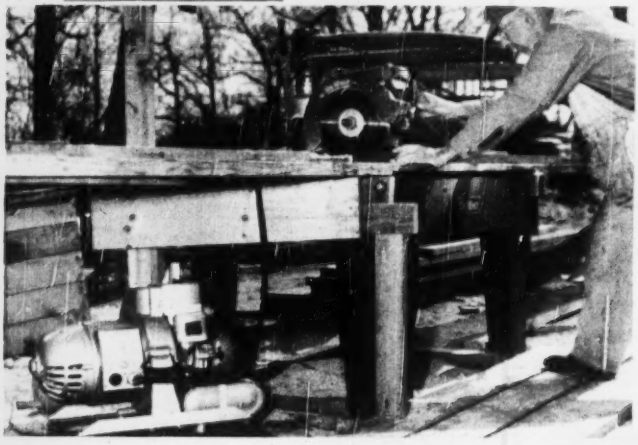
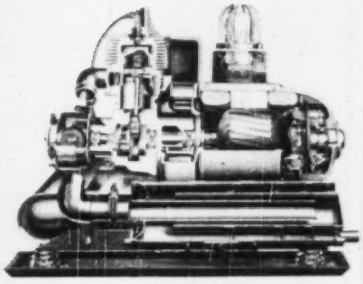
You Need All Three...You Get All Three

1. PERFORMANCE, 2. DEPENDABILITY, 3. SERVICE

HOMELITE *Carryable* GENERATOR





1. Performance. True, a Homelite Gasoline Engine Driven Generator is light enough for one man to pick up and carry but its performance is big enough to operate all your electric hand tools. In fact, it gives you power *plus* . . . power plus a large overload capacity . . . power plus a constant voltage under all loads . . . power that isn't sapped by long dangerous cables. Easy to get on the job, quick to start at all times, never bothered by extreme temperatures, a Homelite will keep your power tools going at peak efficiency always. It will save time and money for you on all jobs. Ask for free demonstration and see for yourself.

STICK TO THE RULE OF THREE: 1. Performance, 2. Dependability, 3. Service, and you'll always stick to a Homelite

2. Dependability. For more than 25 years, Homelite engineers have specialized in building carryable gasoline-engine-driven units. Their experience in building close to three hundred thousand of these units has been responsible for the simplicity of design and precision construction with finest materials that insure long-haul dependability and lowest maintenance costs.

3. Service. A Homelite seldom needs service, but when it does, there's a trained Homelite service man near you . . . a man who will drive his truck right out to your job and put your Homelite in perfect operating condition. This prompt, competent service is a great money saving factor for those who want to get continuous production out of their power tools.

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CORPORATION

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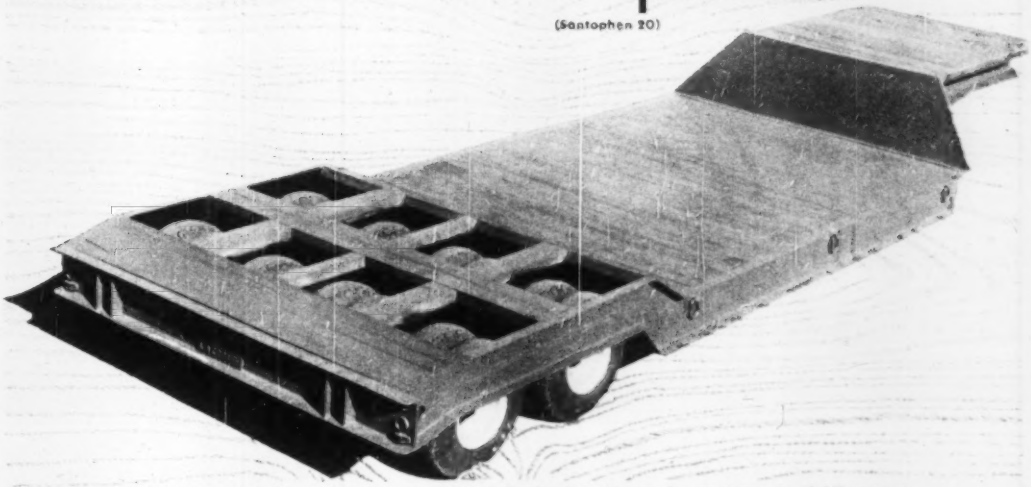
Pachyderm of trailers protected by Monsanto PENTA CHLOROPHENOL preservative

(Santophen 20)



MONSANTO PENTA protects the decking in this mammoth, 54-ton La Crosse Trailer. The deck is made of 2½-inch oak.

A formulation of Monsanto Penta adds to the life of the decking of the 54-ton La Crosse Trailer by increasing its ability to withstand wood rot and by guarding it against damage by insects and fungi.

Monsanto Penta can be formulated to give *clean* treatment, even making treated wood paintable. Penta stays in the wood through blistering sun. And, since penta is virtually insoluble in water, the treatment withstands exposure to rain and snow. Monsanto Penta is positive protection against termites and other wood-boring insects . . . against fungi which cause wood to rot.

Penta, which may be applied by pressure, dip or brush methods, is used to protect all types of wooden construction, from bridge timbers to fence posts . . . from barn sills to millwork for fine homes.

If you wish further information about protecting wood with Monsanto Penta, mail the coupon or contact the nearest Monsanto Sales Office. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1759-F South Second Street, St. Louis 4, Missouri.

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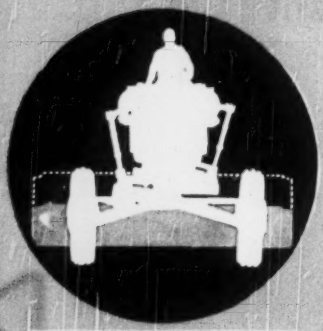
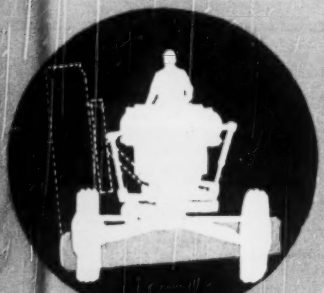
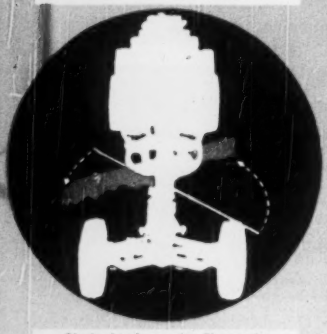


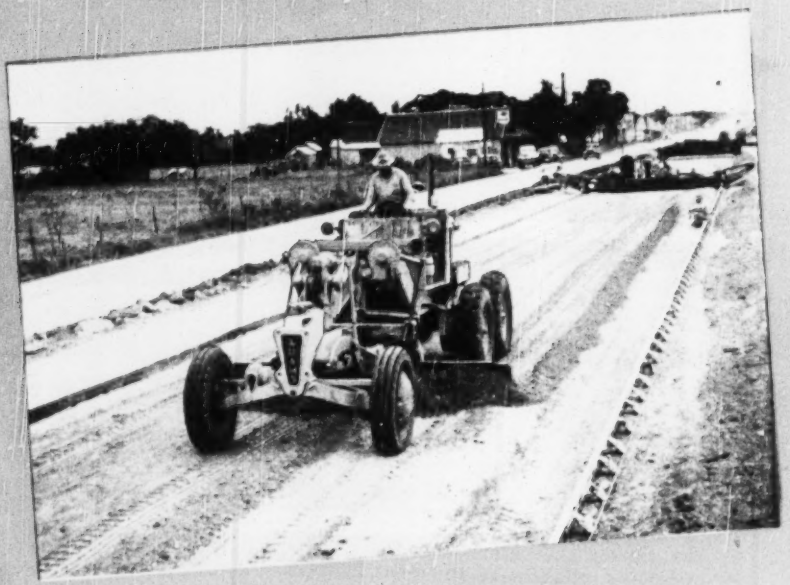
Positive, Accurate Blade Adjustment



Free Blade Movement Without Mechanical Adjustments



Blade Angle can be Changed with Blade Loaded



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THE CONSTRUCTION WEEK

STILL LUSTRON—The harried Reconstruction Finance Corporation hasn't heard the last of its venture into metal prefab housing. Having foreclosed on its $36,500,000 loan to Lustron Corp. three months ago and operated the firm—still in the red—RFC finally tried to buy out the assets for $6,000,000 at a court-ordered auction in Columbus last week. RFC was only bidder at what observers thought was a somewhat steamrollered auction. Its bid was accepted and a $100,000 check deposited. But on June 8, three suppliers, who claimed Lustron owed them a total of $4,842,000, got a temporary injunction blocking the sale. What'll happen now is anybody's guess. But close watchers have been figuring RFC strategy like this: RFC knows of a combination of at least three potential buyers (including a steel company, one of the biggest plumbing equipment firms and a paint-process supplier) who want to buy. So, RFC bigwigs figured their best bet was to buy in all of Lustron's assets, then sell the whole thing as a package, rather than in separate pieces.

U.S. BUDGET—SLOW BUT BETTER—Due, observers think, largely to Congress' recalcitrance, the U.S. budget for Fiscal Year 1950 is far off schedule—but a little to the good thereby. As of June 30, the figures will add up about like this: Spending—nearer $41 billion than the $42 billion planned; Receipts—nearer $37 billion than the estimated $36 billion; Deficit—$4 billion plus, instead of $5.4 billion as forecast. Reasons for the smaller deficit: Business gains have boosted receipts a bit; the Administration hasn't been able to spend as fast as it planned.

THOSE TRUSTS AGAIN—With a partial victory over the Aluminum Company of America under their belts, U.S. antitrust lawyers are turning their guns on their biggest game yet—Big Steel. Washingtonians figure the motives behind the attack on U.S. Steel are double: To break up the company under present laws; prove that present laws must be made stronger.

(PSYCHOLOGICAL) POWER-OF-PRESS DEPT.—To avoid frightening members of the press attending football games, the University of Washington has ordered the addition of stiffeners to the cantilevered roof of its proposed new stadium grandstand at Seattle. (ENR April 27, p 28). The roof covers a 150 x 400-ft. area, to provide unobstructed views for spectators. A press box is to be built atop the roof. Wind tunnel tests indicated that the rare combination of gale-force winds and heavy snow would cause the roof to vibrate in a 12-in. arc, although there's no question of structural safety. University spokesmen, commenting that they had no desire to "scare the pants off" the press, said stiffeners will be added under roof-framing cantilevers.

BUY FROM WHERE?—Seattle's City Light Department found its efforts to get out of an embarrassing position putting it neatly in the middle of an international trade situation. It started some months ago, when bids were opened on a large transformer order. Somewhat startled, City Light discovered low bidders—by a big margin—were two British firms. The bids were rejected on the ground that the transformers were to be installed in the remote Ross powerhouse on the Skagit River, and engineers didn't want unfamiliar equipment. But—seeking to avoid similar situations—City Light asked city officials for policy. The city council promptly brought in an ordinance that would have prohibited purchase of any foreign-made goods unless savings of 25% were assured. This brought protests from foreign representatives, and local businessmen. The council hastily retracted its ordinance, leaving City Light to make future decisions.

STOPPED FOR NO GAIN—Federal power expansionists, who center largely in the Interior Department, got nowhere in their attempts to take over the Army's most recent Omnibus Flood Control-Rivers and Harbors authorization bill. Their chagrin at failure to do so echoed in the statement President Truman made when he signed the measure, (ENR June 1, p 17). Congress refused to strip the Army of jurisdiction it has held for years—and not exercised thoroughly along lines sought by the power expansionists. Two Interior-backed moves to establish inter-agency and state commissions to study New England hydro development and development of the Arkansas, White and Red River basins were thrown out of the bill, leaving these areas under Engineer control. And Reclamation's cherished "basin account," was thrown out, too. (The basin account is a device to pool revenues basin-wide, offsetting basin costs.

PILOT PLANT—The U.S. Public Health Service is looking on its mission to assist Liberia as a pilot test whose results can be applied later to the President's Point Four program for bringing know-how to undeveloped portions of the world. The mission is conducting an intensive malaria control program; operates a model clinic in Monrovia. The program is designed to be taken over by natives as soon as training is completed.

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PULL IT
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INLAND SHEET PILING

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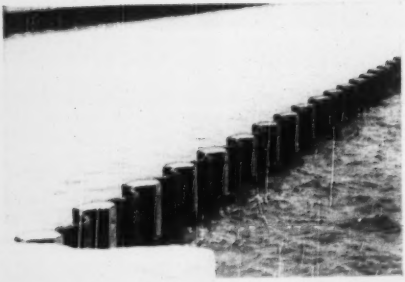

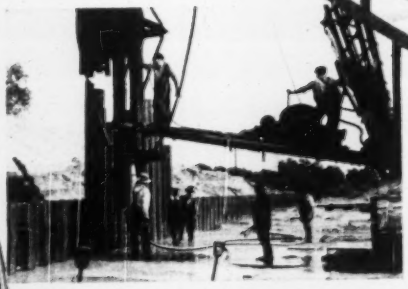

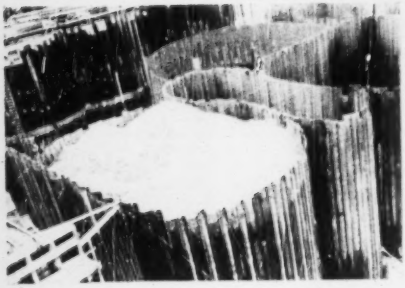

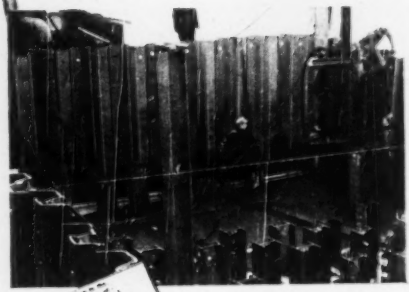

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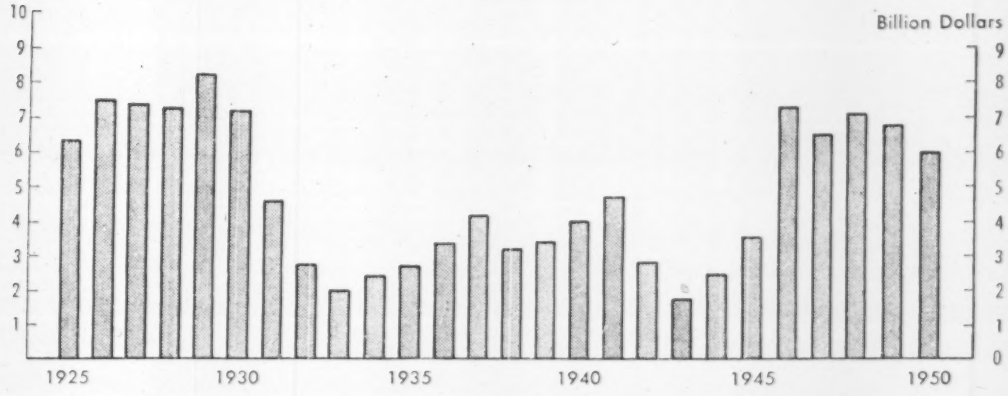
CONSTRUCTION TRENDS

Expenditures for Private Business Construction 1925-1950 -- in constant 1950 prices



Source: Machine and Allied Products Institute and McGraw-Hill Department of Economics

BUSINESS CONSTRUCTION LAGS

Business construction—industrial, commercial, utility, farm building—is lower now than it was twenty years ago—although U. S. population and industrial activity have grown tremendously since 1930.

This is the conclusion of a recently released study of the Machinery and Allied Products Institute. The comparison was made in terms of constant dollars, which adjusts for changes in prices over the years.

Business construction also is lagging far behind business expenditures for new equipment. The MAPI study shows business is spending 50% more for equipment now than it did twenty years ago. (Again the comparison is in constant dollars.) But it is spending 10% less for buildings. Why is this so?

MAPI examines five reasons and comes to the conclusion that all together they don't account for it.

1. Business is making better use of space. Year by year, it needs less space to put out the same amount of production. This is true, probably. But this process was also going on twenty years ago. Its effects today shouldn't be much greater, if any, than in 1930.

2. Overbuilding in the 1920s. This may have happened, although the figures don't show it was great. In any case, underbuilding during the 1930's would have offset it.

3. Shortage of investment capital. This has been an important factor. High taxes and the low level of stock prices have made it difficult to raise money.

4. A decline in the rate of growth of the labor force, the total number of people at work or looking for work. The labor force was growing at the beginning of this century at a rate of 2.5% a year. Now the rate is 1% a year. This is probably important in explaining the drop in demand for new plant space.

5. Construction costs, which in recent years, have increased much faster than have equipment costs. This has increased business' incentive to renovate or re-equip old buildings rather than to replace them.

But all of these things together, in the Institute's opinion, don't account for the lag. What can be done about it? MAPI suggests one thing.

Apart from revising taxes, which is a question of public policy, MAPI suggests speeding up the process of making buildings obsolete. MAPI estimates that almost 60% of all business buildings are more than 20 years old. About 30% are 30 years old, or older.

Better design, more efficient buildings, designed to be built cheaper, could obsolete a huge share of these existing buildings. It would make them too expensive. However, MAPI hasn't considered two factors.

One is that a new machine is easier to sell than a new building. It is a much smaller investment and begins immediately to produce results. The other is salesmanship itself. Equipment is sold in hard-driving campaigns backed by lots of advertising. Salesmen and engineers are constantly demonstrating results.

Buildings, on the other hand, usually are *not sold*. The customer makes up his own mind that he wants a new plant—and then calls in the builders. There's a challenge to construction in both these points.

Finally—the tax problem is basic. Industrial building probably won't reach the levels it should until the taxes that whittle away at equity capital are reduced. That will mean cutting corporation taxes, to allow companies to retain more of their earnings. And it will mean reducing personal income taxes.

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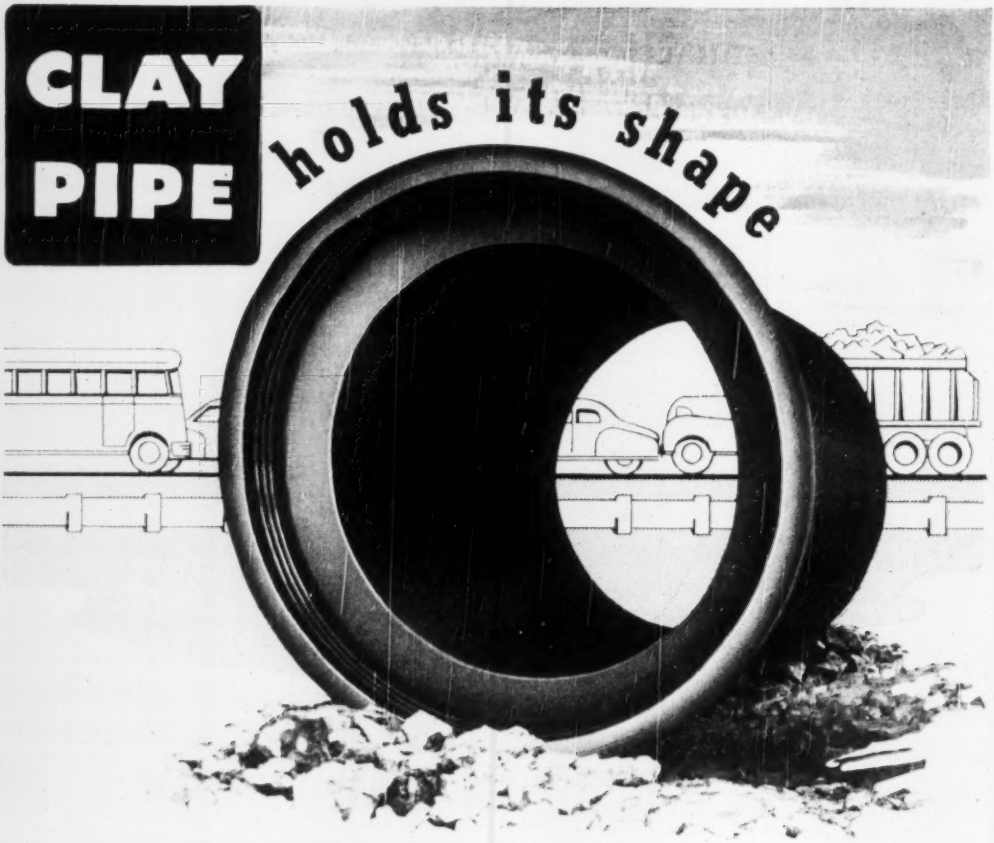

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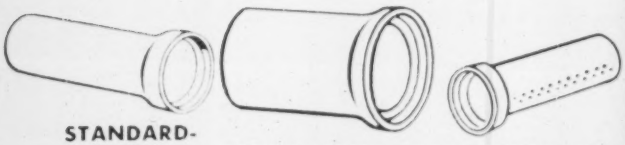

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C-6N-6

New Horizons

SIGNIFICANT ENGINEERING NEWS came out of Washington last week in the guise of a Supreme Court decision and the signing of a bill by the President. They were given no engineering flavor by the headlines, but the possibilities are plain nevertheless.

What happened was this. The Supreme Court ruled that the federal government has top right to the submerged oil lands along the Gulf Coast of Louisiana and Texas. It had acted similarly with respect to the marginal sea lands of California three years ago. And the President signed the foreign aid bill, which included authorization of $35 millions for a start on the technical assistance (Point 4) program for economically under-developed areas.

The possibilities of the Point 4 program are the most obvious, although perhaps not the most immediate. When and if the money is actually appropriated, American engineers will find opportunities beckoning from Asia, Africa and South America. Roads, railroads, harbors, water supply, sanitation and housing are some of the needs that are implicit to the objective of raising the standards of living in these underdeveloped parts of the globe.

The administration is convinced that the program is a necessary part of our cold war strategy, a logical successor to the Marshall Plan. Despite opposition, the appropriation will be made. Congress also may be expected to pass a bill putting the Export-Import Bank in the business of selling insurance to protect American properties abroad and assure conversion of profits into dollars. Even Congressmen who oppose the program on principle admit that private investment must supplement, and eventually supersede government grants if a betterment program for underdeveloped countries is to succeed. The Point 4 program, until now only a hazy idea, is acquiring some substance.

The submerged oil lands decision removes a cause for indecision that has held back off-shore drilling—and the construction of the necessary drilling platforms in deep water. Now it is fairly certain that the Department of the Interior, not state conservation commissions, will call the signals on leasing and production policies.

Oil exploration work can go ahead with certainty. Engineers and construction men have already sensed the possibilities of new business in designing and building the artificial structural islands that comprise the drilling platforms. Some have already been built off the Gulf Coast in 50 ft of water and at a cost of over a million dollars. A company has been formed on the Pacific Coast to build platforms with special caisson legs that can be installed to depths of 200 ft or more. And other designs are rumored to be on the way.

Here are two examples of why civil engineering and construction are at the same time the most exciting and the most satisfying of occupations. New opportunities lurk in almost every happening whether it be political or economic. Each shifts the horizon of activity forward. Each broadens the scope of service. Ultimately, each permits fashioning another step up which civilization advances to better standards of living.

More Power at Niagara

IN A MOVE to take advantage of the added water that will be available at Niagara Falls for power under the pending treaty between the United States and Canada, the Niagara Mohawk Power Corp. has announced its intention to apply to the Federal Power Commission for a license to use that water. The corporation's subsidiary, the Niagara Falls Power Company, owns the existing plants on the New York side and operates them under a 50-year license issued by the FPC in 1921. It also owns and operates a plant on the Canadian side.

Logically, the Niagara Falls Power Co. should be given the preference when the time comes to determine what agency should use the added water for power development. Logic, however, gets little consideration in the planning of the public power enthusiasts. They can be expected to recommend that the water be allocated to a federal agency or to the Power Authority of the State of New York.

Obviously, the power authority or any other public agency to which the water might be allocated could not use the additional water as quickly or as efficiently as could the existing private company. A new agency would have to build new diversion works above the falls. It would have to construct new plants. In contrast, the existing company could put some of the water to use at once in its old plants. And it could integrate its existing diversion facilities and its modern plant with a two- or three-step development of the entire head between Lake Erie and Lake Ontario on the New York side similar to the Queenston plant on the Ontario side.

Under the provisions of the Federal Water Power Act privately owned plants can be acquired by the government at the end of the license period, if Congress decides to take that step. Hence it cannot fairly be said that to license the Niagara Falls Power Co. to use this added water would be alienating valuable rights that should be retained for public use. Actually, they will still be under public control and will be developed at no cost to the public by an agency that is a large taxpayer. Here would seem to be an excellent opportunity for the government to inject some balance and logic into its hydro power program.

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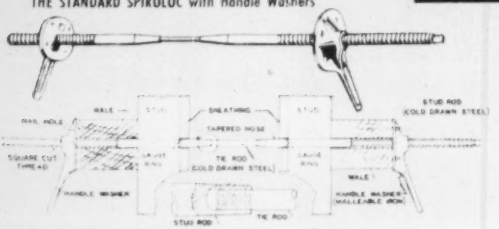
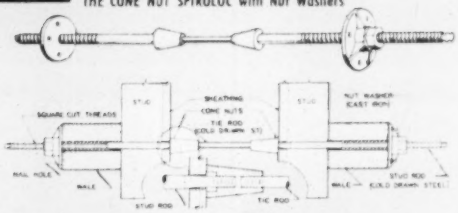


THE CONE NUT SPIROLOC with Nut Washers



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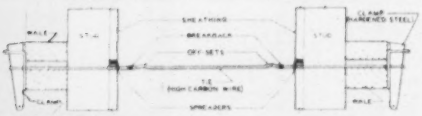
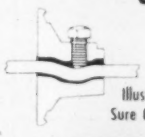


NUT WASHER

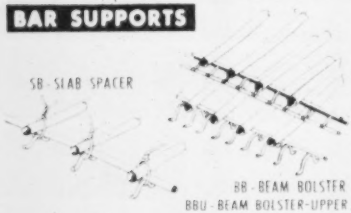
HANDLE WASHER

FORM CLAMPS



Illustrating the Sure Grip Principle

BAR SUPPORTS



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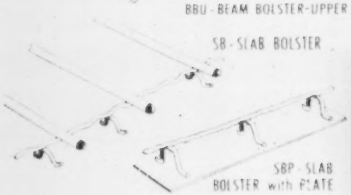
SB - SLAB BOLSTER



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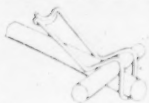

BT - BAR TIE

BC - BAR CHAIR

JC - JOIST CHAIR

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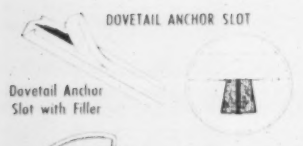
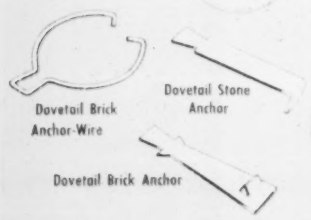
BUILDING SPECIALTIES



DOVETAIL ANCHOR SLOT

Dovetail Anchor Slot with Filler

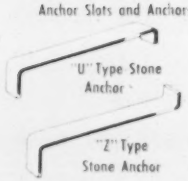


Dovetail Brick Anchor-Wire

Dovetail Stone Anchor

Dovetail Brick Anchor

Anchor Slots and Anchors



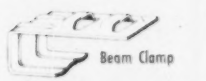
"U" Type Stone Anchor

"Z" Type Stone Anchor

WIRE BEAM SADDLE

Saffit Spacer

Wire Beam Saddles in Place



Beam Clamp

FORM HANGERS

ENGINEERING NEWS-RECORD

JUNE 15, 1950 VOL. 144 NO. 24

NLRB rejects Denham's plan to dispense with elections

Representation votes may be forced if board sustains appeals from "no-vote" policy—Protection assured for construction industry on unfair practice charges

Joseph Gambatese
Washington Staff

The construction industry is on notice this week that the National Labor Relations Board will not go along with its general counsel, Robert N. Denham, in waiving union shop and other elections in the industry.

The unanimous policy statement issued June 6 leaves this situation:

Contractors and building trade unions will remain protected against Taft-Hartley prosecution for unauthorized union shop practices as long as Denham sticks to his present policy, as is his intention. Denham has sole discretion on the issuance of unfair practice complaints.

Denham may be forced to conduct some elections in the industry when his refusal to hold a particular election is appealed to the board proper. Three such appeals are pending.

The board's recent policy pronouncement is its answer to Denham's edict (ENR Dec. 22, 1949, p. 23), that elections be waived in those parts of the construction industry where work is of such a fluid nature as to make it impractical to conduct an election. The one and only such election was held two years ago among five crafts in western Pennsylvania.

Denham would still conduct elections, as he has done, on long-term projects, such as dams and bridges, and in contractors' repair yards and shops. Furthermore, he says he will prosecute any closed shop practices not permitted by Taft-Hartley. No such case has been prosecuted since last June.

Denham expects to quit the first of next year. It's hard to figure what his successor would do. What happens in the fall elections may have a bearing. Changes are a successor would follow Denham's policy because of the support it has from the industry and building trades' unions—and the practical impossibility of holding most elections. On the other hand, if he wanted to force Congress to amend or repeal Taft-Hartley, he might stick to the letter of the law to expose one of its complexities.

• **NLRB looks to Congress.** Nub of the board's statement is that, if some part of the Taft-Hartley law is unworkable, its duty is to report that fact to Congress, "rather than to change the law ourselves by administrative exemption of a single industry."

The board recalled the admonishment it got from the Supreme Court in the Colgate Palmolive Peet decision last December. The board, under the Wagner Act, had improvised the doctrine that employers should not observe their closed shop contracts when it meant firing a worker who was expelled by a union for aiding a rival union at the time of an NLRB election. The board felt to do so denied the worker his right to change bargaining agents.

In the Colgate Palmolive Peet case the court said it is not for the board or the court to justify a policy of Congress or to put limitations on what Congress writes into a law.

In the construction industry, the board points out that as long as Denham does not bring any cases of workers discharged or otherwise discriminated against under an unauthorized union shop practice, it will not have occasion to act. But if the occasion arises, it must enforce the law.

• **Denham has support.** Denham's policy has the support of the Associated General Contractors and the AFL Building Trades Dept. But it is opposed by the International Association of Machinists (Ind.), which has running jurisdictional fights with the AFL Carpenters and Operating Engineers.

The board followed up its policy statement with a decision favoring the I. A. M. in a dispute with the Operating Engineers. This dispute, involving the joint venture of Guy F. Atkinson Co. and J. A. Jones Con-

TO HELP WESTCHESTER MOTORISTS—This steel girder bridge being built over the Hutchinson River Parkway at North Pelham, N. Y., is part of a new swift short-cut between the Hutchinson River and Cross County parkways. The new highway, known as the Wartburg Connection, will be a little over half a mile long, and is costing about $1,597,000. It leaves the Hutchinson River Parkway at North Pelham and joins the Cross County Parkway at Mount Vernon. Another improvement for the Westchester parkways is just about to start—the reconstruction of 2.89 miles of the Bronx River Parkway from the Bronx to a point in Bronxville 2,000 ft north of the Cross County Parkway. Cost of this work will be $3,733,000, and it includes the building of twin roadways 34 ft wide, with seven new bridges.

struction Co., in construction of the Hanford Wash. atomic energy project, served as the basis for the hearing held December 21 which Denham had on his proposal. (See below.)

• **IAM successful** The I. A. M. has tangled with AFL unions 25 times on construction jobs. It claims to have won its point in all of them, the Atkinson-Jones decision being the last. The union also has won elections in construction units and votes involving mechanics claimed by the Operating Engineers. Precedent for the warmest in the election at Strong Co., Springfield, Utah., contractor (ENR Jan. 12, p. 28).

There are four cases pending in which the board may order elections in the construction industry, possibly in a few weeks. Three are appeals by the AFL Plumbers' Union from dismissal of petitions by regional NLRB directors. The fourth was sent to the board for decision by a regional officer in 1948, before Denham's current policy began to take shape. This case involves a petition for election at Ellis C. Snodgrass Inc., Portland, Me., involving an independent union and the Operating Engineers.

The three appeals from petition dismissal:

1. An election request of the plumbers at 26 companies at Oak Ridge, Tenn.

2. An election request of the plumbers' union employees of the Plumbing Contractors' Association of Baltimore, Md., and seven contractors.

3. A union shop authorization election filed by the plumbers and involving the Plumbing & Heating Contractors' Association of Ocean, N. Y.

NLRB upholds Machinists

It's unlawful to sign a closed-shop contract at the start of a job.

NLRB reaffirmed this policy in finding improper the union's agreement signed by the Geo. L. Atkinson Co. and the J. A. Jones Construction Co. with the AFL Operating Engineers at Hanford. (See above.)

The board ordered reinstated, with back pay from February 16, 1948, a member of the International Association of Machinists who had been dismissed because of his failure to join the union.

NLRB held the contract illegal because there were less than 125 employees out of an ultimate total of 5,400 on the payroll when the contract was signed. It rejected company and Operating Engineer arguments that the contract was justified for various special reasons.

Model building code presented to BOCA

Abridged code for small cities is complete—Joint Committee for unification agrees on fire resistance

Value of a unified building code free from the confusion and evil practices associated with administration of specification type codes of most municipalities were emphasized throughout the 35th Annual Meeting of the Building Officials' Conference of America.

Assembling in Indianapolis June 5 to 8, BOCA celebrated completion of its two proposed model building codes. A printed copy of the Abridged Building Code, designed for small communities, was presented to President Albert H. Ruhm, St. Louis building commissioner, by Joseph P. Wolf, Detroit building commissioner. The Basic Building Code is scheduled for publication next month.

• **Five year study** More than five years of intensive study was involved in preparing these codes. Data were collected and prepared for publication by George E. Stecher, New York consulting engineer.

Mr. Stecher outlined the basic concepts employed in writing the codes:

(1) A comprehensive classification of use groups based on fire hazard; (2) classification of types of construction to incorporate new developments; (3) plan for controlled and ordinary materials; (4) performance standards; (5) evaluation of fire resistance of materials and combinations of materials; (6) height and area limitations to give a uniform degree of fire safety for all use groups and types of construction; (7) minimum standard load requirements consistent with functional requirements; (8) plan for coordination of inspection and control to eliminate overlapping jurisdictions. Details were published in ENR Jan. 26, 1950, p. 80.

Plans were also evolved for the Building Officials Association, an affiliate of BOCA, to set up a central clearing house for interpretation of test data with recommendations for their application and for completion and standardization of research data and test procedures.

Eugene N. Smith, director of safety, Wichita, Kan., who is chairman of the Code Change Procedure Committee, recommended establishment of a code changes committee composed of building officials. At least two members should have a structural engineering background, he said, and two should have an architectural background. Proposed changes would be studied by this committee in consultation with seven subcommittees.

Following adjournment of the BOCA convention, a meeting of the Joint Committee for Unification was held. This was the sixth session of the group, which was formed to unify the requirements of the principal national codes. The committee agreed on fire resistance requirements and nearly completed work on live loads. Previously, it had unified definitions and occupancy classifications.

$20 million contract let for Los Angeles building

The west coast's biggest postwar construction project—a $20,000,000 hotel and office building in downtown Los Angeles—has been let to contract by the Hotels Statler Co., Inc. Work is to begin July 5.

Robert E. McKee, General Contractor, Inc., of Los Angeles and El Paso, was awarded the general contract. It involves more than $15,000,000.

The 1,275-room hotel will be the largest such structure built anywhere in the last 20 years, according to Arthur H. Douglas, Statler president. It's to be done within two years. The structure will be built at Wilshire Boulevard, Seventh and Figueroa Streets.

All guest rooms and the entire office building will be air-conditioned. There'll be a 475-car, underground garage, television in every room, large convention and meeting facilities and a swimming pool in a patio. There'll be 150,000 sq. ft. of office space.

Holabird & Root & Burgee, Chicago, and associate architect William Tabler, New York, designed the structure and will supervise Statler during construction. Consolidated Western Steel Corp. and American Bridge Co. will fabricate and erect the steel. The latter will erect the lower portion of the building. Consolidated the upper portion. Plans call for 7,200 tons of steel, erection of which should start in about three and one half months. be completed within six to eight months.

Mehring & Hansen, Chicago, Los Angeles, and Wilmington, got the heating, plumbing and ventilating contract at $3,000,000. Slatom Electric Co., Los Angeles, got the electrical contract at $2,100,000.

Equipping, decorating and furnishing the hotel, along with certain additional structural costs required by the office building, will add between $5,000,000 and $6,000,000 to the amount of the general contract. Douglas said, raising the overall cost to more than $20,000,000.

Northwest water for Southwest deserts sought in Reclamation Bureau study

Diversion of as much as 20 million acre-ft from Columbia and other rivers to southern California is the goal

Vincent B. Smith
ENR's Correspondent

Reclamation Bureau is studying possible transfer of water from the Northwest 1,000 miles to arid Southern California.

In scope and cost, the scheme far surpasses any diversion project or aqueduct system so far considered seriously in this country.

A 20-man staff in Salt Lake City has been carrying on reconnaissance investigation for the last year. Next summer, it will have a report to help determine whether a detailed study is worth while.

• Could be done, but . . . Economic feasibility is the yardstick against which all possibilities must be measured. Physically, the project is readily feasible.

Without defining what kind of feasibility he meant, S. P. McClelland, engineer in charge of the preliminary study, said recently at Salt Lake City that the investigation "has now progressed to a point where its long-range planning studies tend to establish the feasibility of ultimately transferring water from the Pacific Northwest and Northern California to water-deficient areas of the Southwest."

Northwest rivers discharge nearly 300 million acre-ft a year. Diversions from them would take only a small fraction of the surplus water remaining after maximum allowance for every conceivable future development in the Northwest.

McClelland emphasized that fact in his statement on the study project—known as the United Western Investigation. He explained that the limits of economic feasibility probably would allow the transfer southward of less than 10% of the surplus that remains after a reserve for all future Northwest consumption. Actually, other bureau engineers point out, the diversion might take less than 5% of the surplus.

• That's a lot. Even these low percentages could mean transfers in the range of 10,000,000 to 20,000,000 acre-ft a year. A system to handle such volumes over a 1,000-mi route would require a huge investment. Next year's report will give some indication of this cost.

No official guesses on cost are being made now. Still, Reclamation points out that California's Central Valley project requires an investment of $500 million to handle 1,500,000 acre-ft per year over a much shorter distance.

Conservative standards are being applied to estimating future water consumption in the Northwest and to potential economic development of Southern California. Agriculture looms as a large future water use, but prospective domestic and industrial consumption get equal consideration. For the Northwest, the maximum possible development of irrigation, industry and population is assumed. Conversely, but again conservatively, investigators have limited the vast irrigable area in the Southwest to a small portion that could show sufficient return to justify the cost that might be allotted for the project.

• San Diego to San Francisco. In general, this portion is made up of various irrigable lands lying in a long strip extending from San Diego 500 miles to San Francisco Bay. Other potential users—municipalities and industries—probably could afford to pay more for water than the farmers, investigators concede, but they believe that agriculture would continue to be the big water "consumer." Therefore, it must foot the bill for most of the imported supply.

• It's not simple. Problems without number must be worked out. Not the least of them would be the legal tangles over water rights. And any plan would have made up for power loss in the Northwest. If diversion be made upstream, it would hurt hydro plants below. Should the water be taken downstream, near sea level, pumping power would then be required.

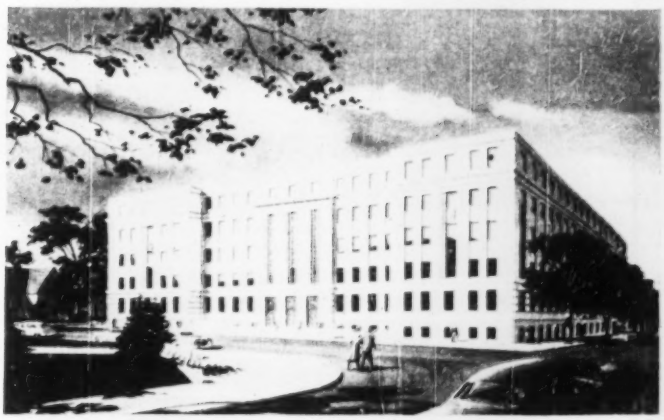
Investigators recognize that the project would have to replace any hydroelectric power it loses in the basin of origin. New power sources developed along the route of the project—hydroelectric and thermal—would have to make up for the deficit. In the present investigation, steam plants are contemplated. Local fuels, such as low grade coals, are being seriously studied.

Another important problem involves fisheries and national or state parks. Whatever the route, a series of compromises would be necessary with public agencies and civic groups that fight steadfastly to conserve all natural scenic beauty and fish and wildlife resources.

• Everybody's skeptical. Pacific Northwesterners are not alone in their suspicions. Californians—the potential beneficiaries—are notably cool toward the United Western Investigation. They regard it as a vague promise—or a red herring—to distract them from their fight for California's share of Colorado River water.

Potentially, the project could deliver to Southern California far more than the state is entitled to from the Colorado. California claims about 5,500,000 acre-ft a year and the total

(Continued on page 26)



NORTH CAROLINA ROAD HEADQUARTERS—Work has begun on this $1,500,000 structure at Raleigh, N. C., to house the State Highway and Public Works Commission. It will be part of the monumental state capitol group. All drafting rooms and commission offices will be air conditioned. There'll be a 500-seat auditorium with stage. The building's to be ready early in 1952. Allen J. Maxwell, Jr., of Goldsboro, N. C., is architect. Frank P. Clarke Associates and L. E. Mooten & Co., of Raleigh, are engineers.

States open drives on water pollution

Recreation season spurs activity in several jurisdictions—Federal agency urged to leave abatement to states

With the approach of normal heavy use of recreational aspects of water supplies, many states began more intensive drives to clear their streams of pollution last week.

At the same time, state sanitary officials had served notice on the federal government that they consider the elimination of pollution a state job, whether or not their efforts are financed by federal fund.

On the local front, the states moving toward better control included Delaware, where the state Water Pollution Control Commission set itself a two-point goal: The establishment of general rules that will require submission of plans to prevent new pollution by new industrial plants, requiring permits for the right to continue discharge of wastes into state waters.

At Pierre, S. D., the signing of the South Dakota Reclamation Association, a water pollution commission was formed, under Dean A. M. Hardgrove of the state college at Brookings, to present recommendations to the President's Water Resources Policy Commission. In New York State, the Water Pollution Control Board scheduled the first of seven meetings for this week in Buffalo as a preliminary to setting up statewide water classification system under which pollution control orders would be issued.

As part of continuing programs, San Jose, Calif., voters approved a $7,000,000 bond issue to provide a treatment plant that will bring the city into line with orders of state health authorities. And in Pennsylvania the State Sanitary Water Board refused to approve a delay in compliance requested by a number of municipalities along the Susquehanna and Juniata Rivers. Rejecting the municipalities' plea of insufficient funds, the water board said in effect, that other communities had managed to surmount the same problems, and the two cities in question must do the same.

• **Hands off**—The declaration of state jurisdiction in pollution control matters was a dominating theme of a Washington meeting of state sanitary engineers.

With officials of the U. S. Public Health Service, led by Carl E. Schoedy, chief of the USPHS Water Pollution Control Division, and himself a former state official, likewise in attendance, the state men made their meaning clear in no uncertain terms.

Abolition of water pollution is the job of the states," said B. A. Poole, director of Indiana's Bureau of Sanitary Engineering. "It is part of the states' police powers. The Federal government should step in only when the states can do nothing among themselves." Other speakers added that direct federal control should be limited "to the national interest."

State officials took advantage of the meeting and the presence of USPHS personnel to register another complaint: they are not at the least happy with attempts of the federal organization to recruit technicians of all types for its service. Several charged that, despite the intent that the national organization would train men for state service, it has in fact reversed the trend. Taking state-trained men for its own programs.

HANGIN' OFFENSE IN NYC

George Cropper, of Muncie, Ind., was digging a garage foundation some days ago, and it's a mighty good thing he was.

Cropper discovered a 400-gal. per hr. leak in the city water system. It had been flowing for 45 years—since some one tore down a house that once stood on the site. No one remembered to turn off the connection then. So the water has been flowing since—into the sewer through a drain in the old foundation.

Survey water diversion from Northwest to Calif.

(Continued from page 25)

volume of that stream before any diversions are urged only a little more than 17,000,000 acft consumptive use.

Eventually, Arizona and other Colorado River basin state's might benefit from the west coast project. If California got the extra lake needed from the Northwest, she might relinquish some of her right to Colorado River waters, leaving more for other beneficiaries. That possibility is far in the distant future, but it probably would be a determining factor in getting Congressional approval of the transfer.

Because of their widespread implications, the Central Western Investigation takes in eleven states, from Washington and Montana to California and New Mexico. But the main engineering studies center on the water transfer, to see if it is possible to get enough water, at reasonable cost, to make the project worthwhile. Other natural channels that would fit into such a system, the Sacramento River is one major stream that offers both great location and capacity.

California sewer row brings new sentences

Second group of city officials in six months gets fines and jail terms for failure to pay sewer assessment

For the second time within six months, Los Angeles Superior Court Judge Joseph Vickers has fined and sentenced a mayor and city officials for contempt in their failure to pay the city's share of the Los Angeles Hyperion sewage treatment and outfall line.

This time it was J. Ray Klots, mayor of Culver City, and William G. Douglas, Thomas J. Carroll, Arthur Segtell and Curtis J. Davis who were each fined $500 and sentenced to five days in jail. Douglas and Segtell are councilmen, while Carroll and Davis are still in office. No one has been jailed as yet.

The case was brought by the State of California to enforce a court order of February, 1946, ordering Los Angeles and 10 tributary cities to rebuild the ocean-contaminating sewer outfall then in use. Culver City was ordered to pay $4,176,965 of the $41,000,000 project. The defendants attempted to declare the court order invalid and supported their refusal to pay on the grounds that the city had a 1922 contract with Los Angeles permitting Culver City to use the outfall sewer. While the trial was under way they began action in another superior court seeking to establish the validity of the 1922 contract with Los Angeles.

Judge Vickers ruled that the existence of such a contract was no defense in view of the great emergency created by beach pollution. He held that the city should have paid its share with the proceeds of a rebate in case overrights under the contract with Los Angeles subsequently were upheld in court.

The Mayor of Vernon, Calif., and five councilmen were convicted of contempt under the same charges last January and have appealed. There has been no decision as yet.

The Culver City defendants accompanied their presentation to Judge Vickers, which came after Atty. Edward Scarle said he would appeal the decision.

Culver City Attorney Mellod Teeters's request that he be permitted to shoulder the penalty because the defendants acted on his advice was turned down. "There is no way in which you could have complied with the order and the writ you cannot be held in contempt of it," Judge Vickers told him, refusing flatly to let him assume responsibility for carrying out the sentences.

CONSTRUCTION BUSINESS

High demand unsettles few prices

Sharp price rises that started on lumber, copper, and steel scrap in March show a few signs of easing off.

But materials demand will stay high as long as construction contracts boom. For example, the current record-high construction volume had its first real impact on the materials market in March.

But many materials—cement, brick, roofing, paving—are still in fair to good supply generally, and prices are mostly stable (see ENR June 1, p 23).

Here is how industry experts view the lumber, steel, and copper markets:

• **Lumber tighter than ever**—Lumber mills are turning away orders. Supply and demand can not be measured, because orders-production indexes are invalidated by three things: (1) mills don't count the orders they turn down; (2) marginal producers are now shipping unmeasurable millions of board feet a week, and (3) Weyerhaeuser Timber Co. is out of the market because of strikes.

Prices are still in the upgrade, but some industry spokesmen noted the first sign of easing last week. Small-scale builders without commitments are showing signs of worry over high prices. California lumber demand is off a bit; in New York, inquiries for green fir dimensions are down.

Whether last week's letup is merely a pause or the start of a leveling off, no one can say. Some barometers to watch are: (1) how dealer sales of "transit" shipments are going, and (2) prices of green fir dimensions. On transit shipments, the dealer orders carload shipments before he gets a buyer; he sells the lumber while it is en route. Weakness in demand for the lots in transit may worry the dealer into cutting his asking price. Price of green fir is volatile because most western builders take it only when kiln-dried lumber is not available. As soon as there is hope of getting kiln-dried again, they stop ordering shipments of green lumber.

• **Steel**—Composite steel scrap prices hit an all-time high of $40.92 a ton last week, up $3.67 in one week and $14.67 over the first of this year, according to Iron Age. This pushes mill cost up and puts pressure on prices.

In spite of these costs, steel experts expect no general increase in base mill prices on construction steel. However, if mill costs rise too far, steel prices must go up.

But late last week No. 1 heavy melting scrap dropped $2 a ton at Pittsburgh. The big steel mills are holding the line. Part of the recent scrap price rise has been absorbed by the mills and part by customers through scrap conversion deals and premiums.

Demand is strong, as shown by last month's $4-a-ton price hike at warehouses in most cities (ENR June 8, p 30).

Finished steel made from scrap bought at present prices already costs an average of $2.3 over December. For large mills the cost increase to date may be as low as $1, while for some small ones, it may be $8 a ton.

For every $1 increase in scrap from current prices, steelmen estimate costs for the whole industry will go up roughly 30-40 cents a ton.

• **Copper**—Many consumers will be paying 24½ cents a lb for copper next month if Congress allows the 2-cent tariff to go back on.

At 22½ cents, copper is already up 6¼ cents or 40% over a year ago. Demand is still not satisfied. Further upward pressure hit the market last week with the closing of Anaconda's giant Chuquicamata mine in Chile.

Far West labor talks snagged on wages

The Southern California basic trades agreement on an 8-cent raise has hit a snag. At the same time, negotiations between six Utah unions and contractors of the AGC Intermountain Branch have broken off, with a strike vote threatened.

• **Southern California**—Carpenters refuse to ratify the 8-cent raise tentatively agreed upon by representatives of six basic trades, including the carpenters. The carpenters seek to make their own deal with contractors for a 13-cent raise to $2.25. They say they need this because the formerly agreed raise to $2.20 would be "no higher than the engineers and 5 cents less than the cement finishers," according to Joseph Cardenas, president of the state carpenters council. None of the unions in the region have yet ratified the 8-cent raise agreement.

The threatened break-off from the five other basic trades would upset the Southern California wage negotiation pact established in 1941.

• **Mountain stalemate**—Both sides have withdrawn former offers in the Utah construction wage dispute. The federal mediator reports the unions' last offer was to take a 20-cent wage increase for one year, or 15 cents now and 15 cents next year in a two-year agreement.

Contractors offer a 7½-cent raise now and another 5 cents next year, provided the contract is extended to June 1, 1952.

With negotiations halted, unions threaten a strike vote. The contractors say they will regard a strike against one company as a strike against all AGC members.

June construction costs 2% higher than May

The ENR Construction Cost and Building Cost indexes are 2% higher than they were a month ago, because of lumber and wage cost increases.

The Construction Cost index for June is 500.45 (1913 = 100); 2.0% above May and 6.9% higher than a year ago. The Building Cost index is $572.96, up 2.4% from May and 6.8% from June, 1949.

Lumber and labor cost increases drove costs to these new highs. Lumber prices in 20 cities now average $90.10 a M for 2x4s (job city). That is 7% higher than a month ago, 15% above January 1, and 14% above a year ago. New labor contracts bring the national average for common labor cost to $1.528 an hour, 1.4% over last month, 2.9% over January 1, and 6.6% over June, 1949. Skilled labor cost now averages $2.517 an hour, 1.3% above May, 2.2% above January 1, and 5.1% above a year ago.

New England boom

Engineering construction contracts in New England are 7% ahead of last year. Five-month total of heavy construction awards through May is $231,158,000, as reported by ENGINEERING NEWS-RECORD.

May contracts totaling $55,176,000 are 55% over a year ago.

Total contracts through May are 67% public and 33% private. Compared with last year, public contracts are up 110% to $154 million, and private awards are up 56% to $81 million.

Highway construction and public housing account for most the public works contracts. Streets and roads through May total $40,327,000. Public housing totals $48,362,000, of which Massachusetts authorities let $24,692,000, Connecticut $20,549,000 and Rhode Island $3,121,000.

Large-scale private housing contracts are up 430% this year to $47,491,800 in the first five months.

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 83, went to press)

Chemical Plant Additions—Dow Chemical Co., Freeport, Tex., has put announced a five year construction program at Freeport plant to cost $30,000,000.

Apartment—Parkways Gardens, Chicago, Ill., awarded contract for housing project in Chicago to Patrick Warren Construction Co., Chicago. Estimated cost is $5,300,000. Holsman, Holsman, Klekamp & Taylor, Chicago, are architects.

Atomic Energy Project—U. S. Atomic Energy Commission, Washington, D. C., plans heavy water production plant at Wabash Ordnance Works, Newport, Ind., to cost about $5,000,000.

Apartment—S. Patti Construction Co., Inc., Kansas City, Mo., will construct apartment in North Kansas City, Mo., for North Kansas City Development Co., North Kansas City. Estimated cost is $3,000,000. Howard F. Fisher & Associates, Inc., Chicago, is architect.

Bull Shoals Power House—Ozark Dam Constructors, Houston, Tex., the second low bidder has been awarded a $1,747,625 contract for Bull Shoals Power House, near Cotter, Ark., by U. S. Engineers, Little Rock, Ark.

Hospital—Department Public Improvements, State of Maryland, Baltimore, will open bids July 7 for hospital at Mount Wilson State Hospital, Mount Wilson, Md. The project will cost about $4,000,000. Buckler, Lenhagen, Meyer & Veers, Baltimore, are architects. Charles L. Daniels, Baltimore, is mechanical engineer and Sindler, Wellman & Associates, Baltimore, are structural engineers.

Apartments and Shopping Center—Joseph E. Burnett, Maywood, N. J., plans constructing thirty 1-story apartment buildings and shopping center to be known as Crowley Knolls, in West Orange, N. J. Total cost will be $4,000,000.

Sewage Plant and Sewers—City of Cleveland, O., will open bids July 7 for intercepting sewers, digestion tanks and six concentrating tanks for sewage plant. Estimated cost is $2,250,000. Havens & Emerson, Cleveland, are consulting engineers. J. C. Warnick is city engineer.

Office—The Pennsylvania Department of Property & Supplies, Harrisburg, Pa., plans office building for housing Unemployment Compensation Bureau, State Department Labor & Industry, at Harrisburg at about $6,000,000. Lacy, Atherton & Davis, Wilkes-Barre, are architects and W. B. Jeffers is chief engineer for owner.

College Buildings—Yale University, New Haven, Conn., has selected Douglas Orr, New Haven, and Eero Saarinen, Bloomfield Hills, Mich., as architects to make preliminary studies for group of college buildings to cost about $12,500,000.

Research and Engineering Building—International Harvester Co., Fort Wayne, Ind., will soon let contract for research and engineering building at Fort Wayne, to cost about $6,000,000. Albert Kahn Associated Architects and Engineers, Inc., Detroit, Mich., is architect-engineer.

Roads—Bids will be taken June 26, for eight major traffic relief projects in New Jersey, including sections of Freedom program by the New Jersey State Highway Commission, Trenton. Total estimated cost is $8,000,000. Edward W. Kilpatrick, Trenton, is State highway engineer.

Hospital—Pavavant Hospital, Jacksonville, Ill., has awarded contract to J. L. Simmons Co., Inc., Chicago, Ill., for hospital in Jacksonville at about $2,000,000. Edgar Martin, Chicago, is architect. Alexander J. Sineis, Chicago, is engineer.

Housing—Edwin Moss & Sons, Inc., Bridgeport, Conn., was low bidder at $2,824,000 when Waterbury Housing Authority, Waterbury, Conn., opened bids June 6. Albert B. Lucito & Sons, Waterbury, are architects.

Plant Addition—Kennedy-Clark Corp., Neenah, Wis., plans plant addition to cost about $2,000,000.

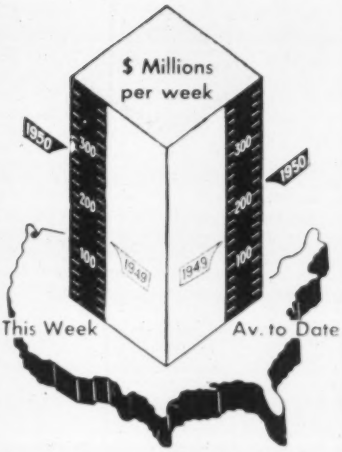
Roads—Pennsylvania Turnpike Commission, Harrisburg, Pa., awarded contract for 3.45 miles Pennsylvania Turnpike in Allegheny County, to Harrison-Cardinelli Co., Pittsburgh, Pa., at $2,276,567 and 3.94 miles of same section to Patterson Construction Co., Monongahela, at $2,422,071. R. B. Stone is engineer for project.

Court House Annex—Christian & Bell Co., Atlanta, Ga., will build court house annex for Fulton County, at Atlanta, for $2,135,500. Burde & Humphreys and W. J. Creighton, Atlanta, are architects.

COSTS AND VOLUME

ENR INDEX NUMBERS

Index	Base	100	1913	1913
Construction Cost	June '50	566.43	2743
Building Cost	June '50	372.90	2015
Volume	May '50	414	206



Activity This Week

As reported to ENR (in millions of dollars)

Amount of contracts let

Week of	1950	1949	Cumulative
June 15	424	424	%
1950	wks.)	wks.)	chge
Federal	$221.4	$168.5	+31.4
States & Muni.	73.5	123.8	-40.6
Total Public	$294.9	$292.3	+0.9
Total Private	180.1	278.5	-35.3
U. S. Total	$475.0	$570.8	-16.8

Contracts by type of work

This Week	1950 424 wks.)	1949 424 wks.)	Cumulative % chge
Waterworks	$25.6	$105.1	-75.6
Sewerage	7.6	11.4	-33.3
Bridges	6.6	17.9	-63.2
Industrial	27.4	30.2	-9.3
Commercial	19.9	22.3	-10.8
Public Buildings	42.0	120.2	-65.1
Earthwork & Drainage	14.6	14.9	-2.0
Highways	150.8	218.2	-30.9
Unclassified	15.8	23.2	-31.9
Total	$294.9	$562.4	-47.6
Residential	27.4	30.2	-9.3
Industrial	19.9	22.3	-10.8
Commercial	42.0	120.2	-65.1
Educational	14.6	14.9	-2.0
Hospital & Institutional	14.6	14.9	-2.0
Public Buildings	42.0	120.2	-65.1

NOTE: Miscellaneous projects included in Waterworks and Waterway projects.

New capital for construction

	1950 424 wks.)	1949 424 wks.)	Cumulative % chge
Corporate Securities	$342.7	$1,200.8	-72.5
Sales of Bonds	98.4	304.8	-67.7
Stocks	244.3	896.0	-72.7
Total Capital	$1,251.2	$2,185.9	-42.8

Hempstead incinerator below estimated cost

Plant will serve 125-sq mi area on Long Island—Capacity equal to anticipated 1970 conditions

Hempstead, Long Island, is looking two decades ahead as it starts construction of a refuse-disposal plant this week—it will cost the town less to do so than it had expected to pay.

Contracts, covering general construction, boiler and furnace equipment, and plumbing, have been let at about $1,220,000. Consulting Engineer Henry W. Taylor had figured they would cost more. When the plant's finished a year from now, towns in a 125-sq mi area around Hempstead will have disposal capacity adequate for 1970's anticipated conditions.

• **New practice**—The plant will have numerous engineering features uncommon to incinerator practice. Among them are: Remote control of the pit bridge crane from a pulpit on the operating floor (no traveling cages); single-line buckets on the crane, also remotely controlled; two enclosed tipping rooms; two separate refuse pits, one of which may be cleaned while the other's in use; submerged ash conveyor systems; and elevated ash storage with truck removal at grade.

Provision also had been made for separation of cans from furnace residue. Cans will be collapsed before disposal, which will save 45% in volume of furnace residue.

Included in the 16-acre plant site will be 120 acres for planned landfill disposal of furnace residue. Non-combustibles collected separately also will be dumped on this area. The filled land will be reclaimed for other use.

Of special interest to air pollution-abatement enthusiasts is the fly-ash interception system. It'll be connected to the furnace and boiler system and followed by tubular, cyclone-dust collectors. It will be guaranteed to intercept 95% of particles above 15 micron size and 90% of those larger than 10 microns. (One micron equals 1/25,000 in.)

Boiler and refuse furnace will be equipped with induced-draft fans driven by magnetic drives for speed regulation.

• **Note the chimneys**—A black chimney, a characteristic of refuse incinerators, will be missing on this project. Instead, there will be two short steel stacks—which will hardly be visible. They'll extend about 12 ft above the parapet. Exit velocity from them will be 60 fps. Waste heat will be utilized to produce electric power. The plant's potential is 6,000 kw.

General contractor for the project is Hendrickson Brothers, Valley Stream, N. Y. Contracts for heating and ventilating, electrical work, turbogenerators and accessories, landscaping and transfer stations are expected to be let within the next few months.

BUILDING AHEAD—The community refuse disposal plant for the Town of Hempstead, N. Y., will serve a 125-sq mi area, with capacity for anticipated 1970 requirements. Refuse will be carted to transfer stations and trucked in bulk to the incinerator. Short stacks with induced draft replace the conventional tall brick chimneys.

Milwaukee grand jury cites faulty sewers

A Milwaukee grand jury has handed up an amended report citing 16 examples of alleged faulty sewer construction.

The report held that the deficiencies "would seem in most cases to have been the result of neglect to act and a lack of diligent effort to compel contractors to comply with specifications, rather than positive malfeasance." The report also called for a city investigation, citing facilities at the city's command which are not available to grand juries.

Principal specifications of improper work accepted by the city include:

1. Tunnel walls from one to 2½ in. thinner than called for.
2. Large boulders used in backfill.
3. Mortar joints instead of Weston joints for pipelines.
4. Badly honeycombed and understrength concrete.
5. Lack of proper grade to sewers because they were built under water in violation of specifications.

In suggesting a city investigation, the grand jury report asserted:

"The city may also be in a position to take action to prevent excessive fraternization between city officials and the sewer contractors' association in the future."

Urging a city probe, the grand jury noted that the city has equipment, including laboratory facilities, which is unavailable to the jury and which "... may make it possible for the city to uncover deficiencies beyond the power and financial means of the grand jury."

Aerial spraying used to clear reservoir

Columbia Basin project site is to be cleared of sagebrush by chemicals—Time saving expected to be large

Two gratis, 50,000 gal of a plant-killing chemical mixed with oil and 10 days are all that contractor J. W. Hudson of Yakima, Wash., expects to require to clear the sagebrush from a 20,000-acre reservoir site in the Grand Coulee gorge of central Washington.

The same job done by ground dragging would take months.

Miles of barbed wire and fence posts were removed first. Then two planes, flying at 12 to 20 ft when possible, spray a mixture of 2,4-D and 2,4,5-T in an aromatic oil, work about 18 hours daily. They carry 60 to 90 gal of the mixture, use about four gal per acre. The dried brush is to be burned in July or August. Planes use a series of three or four temporary landing strips and load to renew their spray tanks every 10 minutes.

The job, for which Hudson holds a $348,963 contract with the Reclamation Bureau, is believed the largest acreage to undergo a single spraying attack in the short history of aerial spraying. It's necessary so that the shrubbery is killed before water flows into the reservoir. Were it not killed, seeds might be distributed throughout the basin by water flowing through irrigation canals.

Water storage is to start in the reservoir next year. The coulee will serve as an equalizing reservoir for the Columbia Basin irrigation project, which hopes to put water on irrigable land for the first time in 1952, after years of activity on the project by the Reclamation Bureau.

Ground equipment will be necessary to remove trees, stumps, buildings and trash.

Maryland pollution commission wins first civil court action on abatement

Sand and gravel firm ordered to cease dumping inert solids into Indian Creek—California court ok's lease-purchase building law

Maryland's Water Pollution Control Commission won a victory in the first civil court test it undertook under its 1947 law.

The decision came in an injunction proceeding against the A. H. Smith Sand and Gravel Co., of Prince George's County, not far from Washington, D. C. Last year, the commission lost a criminal action against the same defendant in the appellate court.

Instead of granting an injunction, which might have disrupted the operation of a plant employing 1,600 persons, the court retained jurisdiction and gave the defendant his choice of using either of two specified plans for abating the pollution at Indian Creek, a tributary of the Anacostia River. In addition to the two specified proposals, the defendant is permitted to devise such other method as will meet the requirements.

• **Law not specific.** In reaching its decision, the court determined several points not specifically covered by law. These included a determination that the addition of inert material whose only effect is to silt a stream now still be considered pollution even though not specifically so defined. The judge got over this hurdle by finding that the clay and other materials washed out by the sand and gravel plant does render the stream unfit for bathing, for aquatic life and for self purification. Such conditions are prohibited by the act.

Another determination by the court was as to whether the amount of pollution induced by Smith's operation was comparable on the basis of damage to other property owners. On this point, the court found that, although no downstream owners had complained against the activities, the state police power is applicable when the state itself is owner of the stream. The court found that the evidence indicated reasonable use of the creek as natural depository for the type of solid material Smith's does. That insofar, it held as large amounts to justify the state in seeking abatement.

The state's criteria for stream pollution by settleable solids is not greater than 100 parts per million. Smith's effluent exceed this by a large amount. No other complaint was made.

The court held, also, that the fact that pollution of the stream was being practiced by other agencies sewer systems and sand and gravel plants did not lessen Smith's liability to enjoinment.

The Maryland commission hailed the decision as a "clear-cut and forceful backing of the ... commission's] efforts to clean up Maryland waters."

• **Court clears building plan.** Elsewhere in the nation's courts, there were these activities:

California's Supreme Court validated a bill enacted last year to permit the leasing of state land on which private builders might erect structures for state use. Lease terms are not to exceed 40 years, and title to the buildings is to vest with the state on expiration of lease.

Effect of the ruling will be to free several million dollars worth of construction. The test case involved a $350,000 highway patrol building at Los Angeles.

The device was adopted as a means of obtaining state facilities without corresponding capital expenditures by the state. Contracts are let on the basis of the most favorable rental terms to the state after competitive bidding. Plans are drawn by the state architect. Next such project is expected to be a $5,000,000 Employment Department building in Sacramento. Thereafter a $3,000,000 Agriculture Department building is expected to follow.

• **Minimum vs. contract wages.** Texas' Highway Commission wants a rehearing on a court decision concerning minimum wages which must be paid on its projects. It lost an appeal brought by the El Paso Building and Construction Trade Council from the decision of a lower court suit. Brought by the council, the suit aimed at halting an overpass job where the council alleged wages would be sub-standard.

The council claimed that actual wages are anywhere from 10 to 85 cents per hour above the level posted by the commission as minimum. In holding against the council, District Judge J. H. Cadenhead ruled that:

[illegible] minimum wage scales ... Union wage scales are not necessarily the legal minimum wage scales.

On appeal, the Court of Civil Appeals reversed Cadenhead and held that the council has a justiciable interest. The commission bases its appeal for a rehearing on the contention that the council has a legal interest. The motion for rehearing notes that courts have denied contractors and adjoining property owners the right to maintain similar suits.

SHOULD BE INTERESTING

Which is the better highway buy for the state of Indiana, blacktop or concrete?

Well, the State Highway Commission doesn't know, according to Commissioner Sam Hadden, but it certainly figures to find out. It plans to build two strips—one of each material—on a five-mile stretch between Amity and Columbus. That which stands up better automatically will be used in more contracts.

Two engineers killed on Schuylkill dam job

Two engineers for Pennsylvania's Schuylkill River desilting project were killed on the job early this month by a runaway mixer truck. They were James Byrne, of Trenton, N. J., and Emil Larson, of Hamburg, Pa.

The accident took place at the construction site of Auburn Dam, a $2,500,000 desilting basin on the Schuylkill about six mi south of Pottsville. Byrne was chief resident engineer; Larson chief concrete control engineer.

State police said the truck driver jumped the handbrake and left the cab. He walked some distance away and saw the truck start to roll. It headed for the two men, who were watching concreting operations, seated on a timber. Warnings came too late, for the truck struck the men, then rolled over a 150-ft embankment, carrying them with it.

Gen. Shingler assigned to atomic test duties

Brig. Gen. Don G. Shingler has been assigned to temporary duty as commanding general, 7th Engineer Brigade, in connection with Engineer activities on Eniwetok Island.

Eniwetok is an atomic weapons proving ground in the Pacific Ocean. Atomic Energy Commission has been making preparations for an extensive new weapons testing program.

Gen. Shingler will return to his duties as Upper Mississippi Valley Division Engineer when he completes this temporary assignment, the Corps of Engineers announced. In his absence, Col. Beverly C. Snow, St. Louis District Engineer, will be acting Division engineer.

Another shift among Corps personnel sends Col. R. C. Brown, acting assistant commandant of the Army Engineer School, Fort Belvoir, Va., to Wilmington, N. C., where he'll be district engineer. He's to succeed Col. Hilton R. Cole, who has returned to troop duty at Fort Campbell, Ky.

Plan loan program for new markets

Agriculture Committee studies bill for $150 million of federal credit to cities for food handling

Chances look good this week for the inauguration of still another construction program with federal backing.

It's designed to modernize and relocate terminal food markets. Present proposal is for $50,000,000 of direct federal loans and another $100 million in federal mortgage guarantees. Primarily, it's designed to do something about unnecessarily high food distribution costs. As such, the bill affects two of Congress' favorite groups—farmers and small business. This, plus the fact that there was virtually no opposition to the bill when the House Agriculture Committee held hearings on it last week, makes the program look like one which Congress will buy—next session, if not this.

• **Cities are active**—At least 30 cities have drawn detailed plans for new market facilities already, with Agriculture Department help. Among them are Boston, Columbus, O., Houston, Richmond, Va., Milwaukee, Savannah, Indianapolis, Louisville and Cleveland. There are modernization programs in progress at St. Louis, Miami, Hartford and Atlanta. Greenville, S. C., and Jackson, Miss., already have built theirs to Agriculture specifications.

In an average city, about 4,000 carloads of commodities yearly must be handled for every 100,000 residents. All too often, these goods must use ancient facilities—where streets are narrow, off-street parking is not to be had, modern equipment can't be used. The effect on costs of such markets as these is tremendous. In Chicago, it costs about $75 per car to move produce from the freight car to the market and onto retailers' trucks. Well-designed chain store facilities at trackside do the same job for $9.

• **Savings can be large**—Agriculture has compiled some figures on savings which could be realized over and above annual charges. Here are some of them:

Hartford, Conn.: Cost $1,125,000. Estimated savings $130,000.

Atlanta, Ga.: Cost $1,000,000. Savings $384,000.

Houston, Tex.: Cost $1,750,000. Savings $270,000.

Boston, whose existing market is directly in the path of the circumferential highway now building, has one of the largest projects now underway. Plans call for a $14,000,000 terminal market—to handle 4,000 carloads a day, service 2,500 trucks simultaneously and serve 450 wholesale houses.

ALMOST DONE—The new Tacoma Narrows Bridge, successor to "Galloping Gertie," which collapsed into Puget Sound in 1940, is to be open by Labor Day. Steel roadway was completed this month; roadway concreting, now proceeding on top of the steel, will correct vertical curvature. (Wide World Photo)

Research needed for air pollution law

California can't now revise its air pollution control law because it hasn't enough technical knowledge to do so.

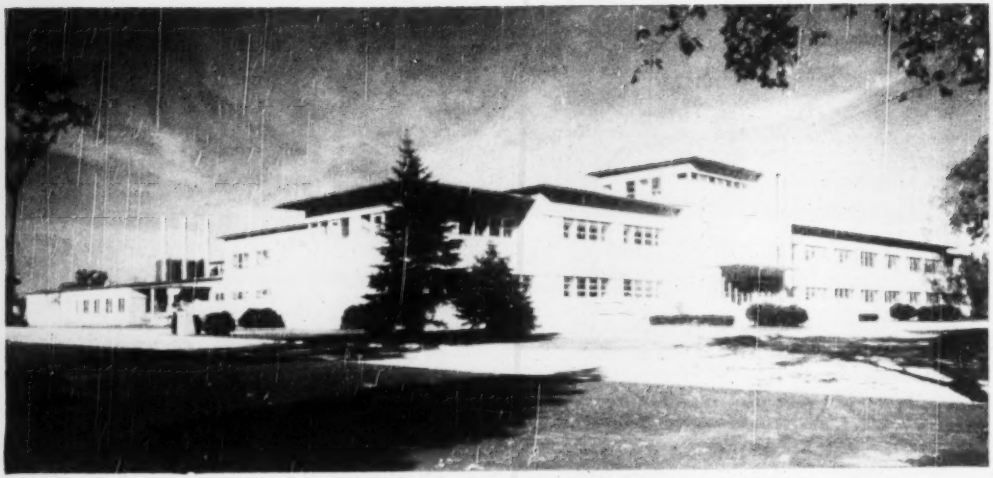
That was the finding of an Assembly committee, which recommended research into the cause and effects of air pollution. After hearings in cities throughout the state, the committee reported that it's a statewide problem, and one which causes economic damage as well as a hazard to public health.

• **Law hasn't worked**—Existing law, the committee noted, has been applied only in Los Angeles, where it's been ineffective. On the insistence of Los Angeles officials that there'd be improvement in time, the committee recommended no changes.

The committee asserted that Los Angeles now bears responsibility for its air pollution conditions. This arose from insistence of officials there that a measure proposing a $150,000 state appropriation for comprehensive air research be withheld. They said an equivalent program would be started by local agencies by next month, and that the state program was therefore unnecessary.

• **Incinerator a problem**—Meanwhile, in Los Angeles, one of the factors which contributes to air pollution there was being attacked again—the two-year-old $1,000,000 municipal incinerator.

The city will seek bids from manufacturers on putting the plant in satisfactory operating condition. The plant, which was accepted by the city and approved by the Air Pollution Control District, was bought on a 10-year, monthly installment plan which was to have been met by payments from licensed rubbish collectors using it. Such fees haven't been sufficient so far because the plant has been shut down for long periods and has never operated at capacity because of numerous difficulties.



Portland Cement Association builds a $3,000,000 laboratory dedicated to . . .

Better Concrete through Research

Dedication of the Portland Cement Association's new laboratories June 8 may well mark the beginning of a new era in concrete research and development. Located in Skokie, Ill., 16 mi northwest of Chicago's Loop, the 8-year project represents the latest thinking in laboratory layout as well as the most modern practices in concrete building design and construction.

Controlled conditions of temperature and humidity in the 30 laboratories and control rooms will permit the testing of concrete and aggregates under extreme conditions—colder than the Arctic, hotter than the Equator, drier than the Sahara and wetter than the Amazon Valley. The laboratories have been in partial operation since last November.

The laboratory group consists of two buildings and contains nearly four times as much working space as PCA's 24-year old laboratory in downtown Chicago. Space units are correlated to insure a smooth flow of materials, while the vast array of modern testing equipment should inspire any researcher to greater efforts.

Precision equipment can measure to 1/100,000 of an inch, or weigh to 1/10,000 of a gram. A specially designed 1,000,000-lb compression machine can test the strength of concrete specimens 50 ft long and as much as 10 ft wide.

• **Will speed research**—Realizing that too much time often elapses between the conclusion of laboratory experiments and their practical application

EXTERIOR FINISH is plain concrete with decorative reeded piers separating aluminum window assemblies (at left), while terrazzo, cast stone and aluminum railings in the lobby (at right) lend a pleasing and sharp contrast to the concrete masonry walls.

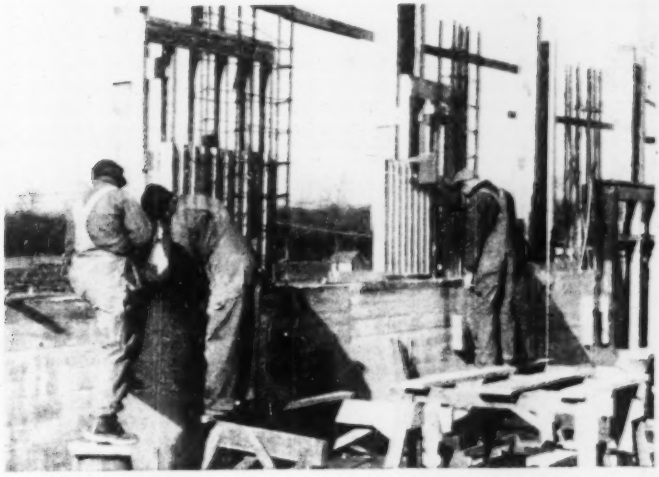
WIDE, shallow girders characterize the framing. The floor slab here is broomed to receive a traprock concrete topping.

one of PCA's objectives is to cut this timelag to a minimum. Facilities of the laboratories will permit both larger-scale experiments and expanded research in cements, soils, aggregates and all phases of cement concrete.

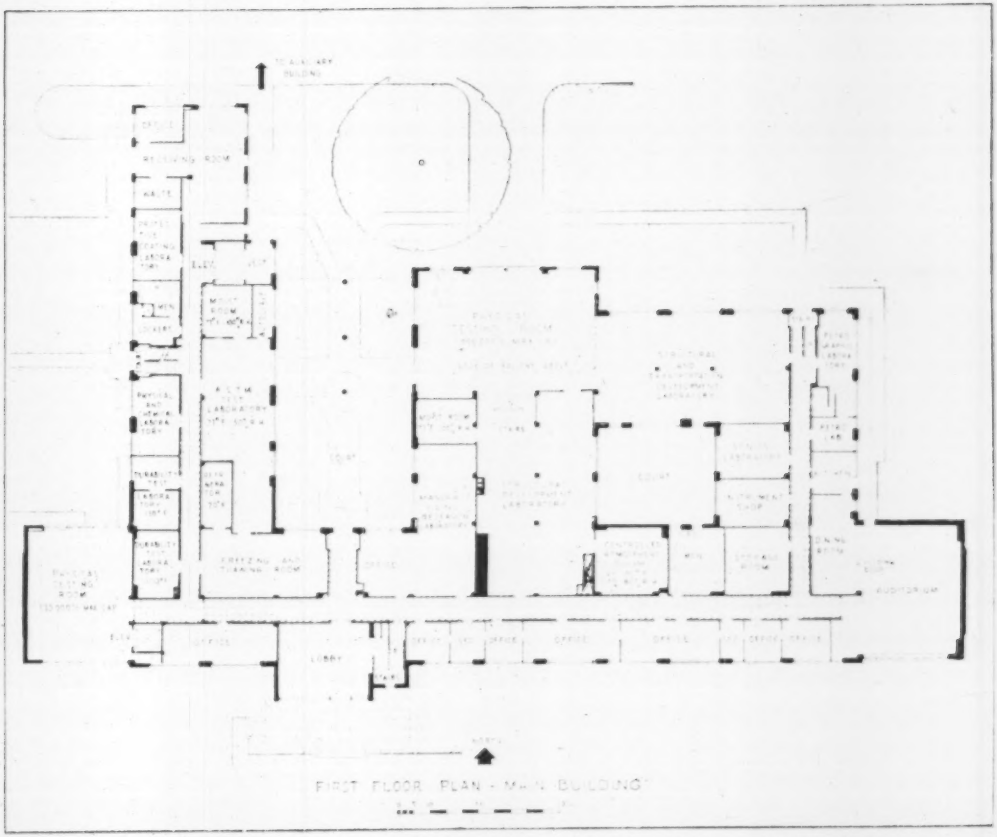
One laboratory, for example, can reproduce actual industrial processes in the manufacture of cements, aggregates and concrete blocks. Soils will be tested in triaxial compression machines and a consolidometer, in the soil mechanics laboratory. Research in the transportation division laboratory will cover soil cements, cement-treated bases, and concrete for roads, streets, railroads, airports, canals.

The durability of concrete specimens will be tested by supersonic methods in one laboratory, while completely equipped physics and analytical chemical laboratories will contribute other modern touches to cement and concrete research.

• **Building details**—Both buildings are



WORKERS erect plaster waste molds, used to form the reeded piers of the laboratory. Molds were not removed until all construction operations that might mar the surface were completed.



THIRTY LABORATORIES and control rooms in both buildings were laid out for minimum materials handling and maximum operating efficiency. Offices in the main building maintain close liaison with all research activities.

of architectural concrete and concrete masonry construction throughout. They are connected by an underground pipe tunnel and a concrete-canopied walkway. Aluminum is used in window assemblies, screens, stair railing, and for a small amount of exterior trim. The main building, containing 80,000 sq ft of usable floor space, is two stories plus basement and penthouse. It is roughly an F-shaped structure with wings extending to the rear, and connected to each other.

The auxiliary building is one story without basement, containing 18,000 sq ft of floor space. Its principal purpose is for the storage and processing of cements, aggregates and soils. Some of these operations require high temperatures and relatively heavy or dust-raising industrial machinery, consequently, the building is equipped with overhead cranes and has dust-collecting equipment on its roof. A wood-working shop, small garage and boiler room also are located in this building.

The main building houses the offices and laboratories of the various research and development sections, including their related temperature, humidity, chemical and physical testing rooms. It also contains a small cafeteria, a technical library, auditorium, conference and reading rooms and a machine shop.

• **Designed to fit needs**—Similar to industrial plant layout, the functional requirements of the laboratories were determined first, then the buildings were designed to fit them. Logically, structural concrete was chosen for the main material, with partition walls being either cast-in-place concrete or concrete masonry. Both buildings have bearing walls. They are supported on spread footings in the auxiliary building, and on concrete-filled corrugated steel-shell piles in the main building. The largest piece of testing equipment, the 1,000,000-lb compression machine, sets on a 260-cu yd articulated concrete base, supported on 27 piles driven to a 50-ton resistance.

• **Reeded piers for beauty**—Exterior walls of the auxiliary building are 12 in. thick. Those in the main building are 11 in. Large windows are provided in the main building, flanked on each side by 8-in.-thick reeded piers, stepped back 3 in. from the outside face of the concrete walls. These reeded piers, which were cast in wood or plaster waste molds, relieve the monotony of plain surfaces. Wide, shallow girders are used to give ample head room, good ceiling effects and free run for ventilating ducts.

• **Special form boards**—Exterior walls were formed with center-matched Oregon fir boards, which left distinctive grain markings and a pleasing texture, neither too smooth nor too rough. They were cleaned down with a grout containing some white portland cement—applied with a stiff bristle brush, worked in with a cork float and rubbed down with burlap.

Interior walls—mostly cast-in-place in the auxiliary building and concrete masonry in the main building—have several finishes. Some are left unpainted; others, particularly office, lobby, auditorium and corridor walls, are painted with a wide variety of colors.

Walls of the laboratories for controlled humidity are covered with a bituminous seal coat and two coats of aluminum asphalt base paint. Walls in the kitchen and most rooms were finished with portland cement plaster. Cast stone was used effectively in the lobby, front stairway, toilets and shower rooms.

• **Rustication lines**—Control joints are spaced 22 ft apart or less in all walls. On exterior walls beveled joints (rustication lines) were provided for this purpose, as well as for decorative effect.

The vertical rustication lines were spaced to permit the forming between panels of continuous control joints extending from bottom to top of the building. The horizontal rustication lines were spaced to permit re-use of panel forms with only slight alterations after each lift.

Panel forms, made up of 1x8 in. center-matched Oregon fir boards on 2x4 in. vertical studs spaced 16 in., varied from 6 to 10 ft high and 8 to 16 ft wide. All form lumber was dipped in emulsified stearate to reduce shrinkage and prolong its life.

• **Special wall anchorage**—An interesting practice was the use of seismic anchorages to give lateral stability to interior concrete masonry walls. A series of 2x3 in., 14 gage, steel angles was fastened to the ceiling with mushroom anchors set in a powder-driven fastening tool.

The wall bearing design of the buildings called for placing of spandrel beams integrally with the floor slabs. It was realized that the intersecting of deck and spandrel steel would make it extremely difficult to place a low-slump concrete in the piers and interior columns below; consequently, these supporting members were placed first.

This not only expedited the construction but also eliminated the tedious job of cleaning around the deck reinforcing steel since it was not yet assembled when the concrete was being placed in the pier and column forms.

All interior columns are square or rectangular, formed with ¾ in. plywood. There are 6 exterior round columns, three of which support a concrete slab canopy covering the walkway between the two buildings.

• **Paper forms for columns**—The other three columns were cast in conventional steel forms, but the three canopy columns were cast in paper tubes to give a pleasant decorative finish. The paper tubes were strong and rigid enough to permit casting the 13½ in. diameter, 10-ft columns without lateral bracing.

Floor slabs in working areas have a concrete topping containing traprock coarse aggregate. In the auxiliary building, where the floors were placed in one course, the traprock screenings were spread on the surface and worked in with power floats.

For the floors in the main building, which were placed in two courses, a cement-sand grout was spread first on the base course, then a stiff traprock concrete was applied. It was tamped, rolled by hand and power floated to an even surface about 1 in. thick, then finished with troweling machines. A 12,000-psi concrete at 28 days resulted.

Floors in executives offices and corridors are covered with asphalt tile. Those in the lobby and rest rooms have a terrazzo finish.

• **Some radiant heating**—The buildings are heated with a hot water system from one gas-fired and two oil-fired boilers. In addition, the aggregate processing room in the auxiliary building has radiant heating in the floor for fast drying of aggregates while in storage.

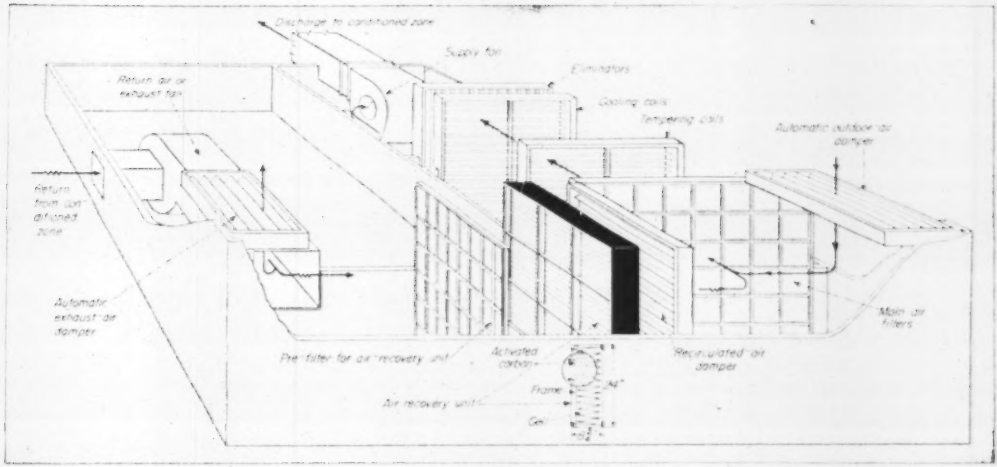
All office lighting is fluorescent, most of which is recessed in the ceilings. Electric eyes mounted at the entrance to the laboratory site warn of any intruders after dark.

Roofs of both buildings are cast-in-place concrete, insulated with 2 in. of Foamglas, covered with tarred paper and crushed stone. Fire doors throughout the building protect spaces containing combustible materials.

• **Men in charge**—Dr. A. Allan Bates, vice president for research and development, is in charge of the laboratories, reporting to Frank E. Sheets, president of PCA. H. F. Gonnerman is Bates' assistant. Miles D. Catton is director of development, and Hubert Woods is director of research.

Carr and Wright, Chicago, were architects on the project, and the Turner Construction Co., of New York City, was the general contractor.

BUILDING DESIGNERS' LIBRARY



AIR-RECOVERY UNITS remove odors from recirculated air in an air-conditioning system, minimize exhaust of tempered air.

Planning for Deodorizing Equipment

J. H. Bartol
Director, Air Recovery Division
W. B. Connor Engineering Corp.
New York, N. Y.

The technique of taking odors out of the air by passing it through activated carbon has developed to the point where it is becoming an important aid in air conditioning.

Installation and operating costs for both heating and cooling of buildings could be considerably less if, once the air has been conditioned, it could be continuously recirculated. This has not been possible—not because the oxygen content would be exhausted or excessive air drawn in to offset such inhibition will contain more than enough oxygen, but simply because odors eventually make the atmosphere stale and vitiated. Some of the conditioned air must be regularly exchanged for odor-free air.

Often, the necessity of heating or cooling large quantities of new air is responsible for a sizable part of the cost of a conditioning plant. Carefully processing an at considerable expense and then exhausting it shortly thereafter is wasteful. How wasteful it is can be appreciated fully when it is recognized that only a few parts of odorous substances per million parts of air are enough to contaminate an entire atmosphere.

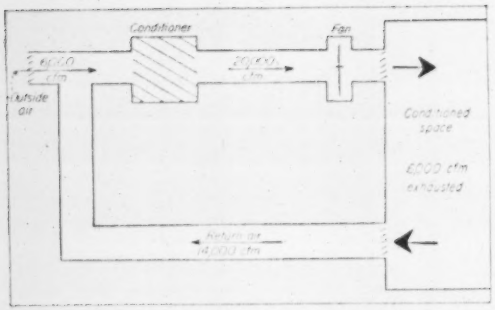
• **Air recovery cuts costs.** With activated carbon to rid room air of odors, this same air, already at the right temperature and humidity, can be used to supply ventilation requirements, thus conserving the energy invested in it. An air-recovery unit of activated carbon capable of converting 1,000 cfm of stale, odorous air to fresh air does the work of 2.5 tons of installed refrigeration capacity and 80,000 Btu per hr of installed boiler and radiation capacity for heating. It is further estimated that each such unit saves 1 kw per average operating hour during the cooling season and 1 gal of fuel oil per average heating hour. (Table II)

Activated carbon is carbon that has been treated to give it high porosity and surface area; each grain becomes honeycombed with countless submicroscopic pores or crevices. As gases and vapors (smells) strike these surfaces, they are absorbed, condensing and clinging stubbornly to the carbon. This process may be continued until the total weight of the impurities is about 20% of that of the carbon. When this point is reached, the carbon may be reactivated, that is, the condensate driven off and the original adsorptive capacity restored. This cycle may be repeated many times.

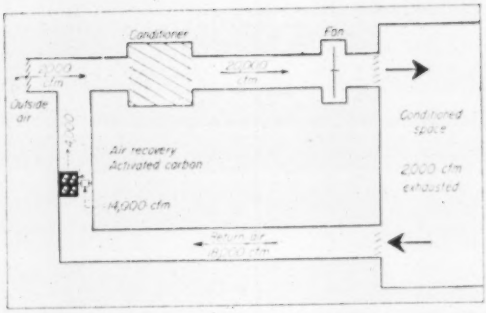
Air recovery is utilized to the full-

TABLE I—FRESH-AIR REQUIREMENTS FOR ODOR-FREE ATMOSPHERE

	Room Space Cubic feet per person	Fresh air—cfm per person
Private Office or Home	1000 and over	30
General Office	500 to 700	15
Conference Room or Game Room	250 to 300	40
Average Specialty Store	400 to 500	15
Department Store	300 to 400	20
Bargain Basement	250 to 350	25
Restaurant (Quality)	350 to 400	25
Restaurant (Average)	200 to 300	30
Night Club or Bar & Grill	125 to 200	40
Theatre or Auditorium	200 to 300	15
School (Children)	200 to 250	30
School (Adult)	200 to 250	20
Hospital—Operating Room	1000 and over	40
Hospital—Private Room	750 and over	25
Hospital—Ward	350 to 500	30
Hospital—Public Clinic	200 to 300	30



BEFORE—Conditioning system supplied 20,000 cfm of air, of which 6,000 cfm of the return air was exhausted.



AFTER—Activated-carbon units were installed to remove odors, cutting the exhaust to 2,000 cfm.

cet extent, it is entirely possible to *limit* outside air intake to the volume required to counteract infiltration. However, where smoking is anticipated, a certain amount of make-up air will be needed to dilute the visible smoke haze. While the irritant gases of tobacco smoke are removed by activated carbon, the smoke particles, being solids, are not absorbed.

• **Space a vital factor**—While the number of occupants in a room and their metabolism is taken into account by the air conditioning engineer in his computation of heat loads, the effect of space per occupant upon the ventilation factor is not always fully appreciated. Odors generated by body, apparel, perfume and food are constant whether a person occupies a small or large space. Therefore, the less space per person in a room the more ventilation air needed to maintain an odor-free atmosphere. Table I gives the fresh-air requirements for various types of occupancies.

Air that has passed through activated carbon should be considered "fresh" air. Often, it is purer and of better quality than air that is drawn in from city streets. The process simply removes extraneous odors without affecting the physical or chemical properties of the air. In the average installation, it is usually necessary to purify only a part of the return air, the balance being by-passed around the unit.

• **Device occupies small space**—The most efficient type of air-recovery equipment is the recently introduced cell unit. This device has the same overall dimensions as a standard dust filter—24 x 24 in. by 8½ in. deep—and is installed and removed in essentially the same way. Each cell is enclosed in a supporting frame for fitting to duct or casing. When one unit is not adequate to meet ventilation requirements, two or more can be used.

The "accordion-pleat" construction of the filter element provides a face area of 25 sq ft. Odor-holding capacity is over 5 lb.

• **Seafood odors removed**—A good example of the advantages of air recovery is an application of air recovery cells made by a Chicago hotel. The hotel management decided to open a seafood restaurant adjacent to its night club. They found, however, that the existing central air conditioning plant was handling close to its peak load and that it was practically impossible to find space for more equipment.

The ventilation problem was finally solved by taking used air from another area of the hotel—air that, though stale and vitiated, was at the proper temperature and humidity. This air was put through activated-carbon cells.

In this manner, it was possible to supply about 6,000 cfm of fresh, odor-free air to the new restaurant. Net saving, compared with the cost of the heating and cooling equipment that would otherwise have been required, is estimated to be more than $4,000. And $500 is expected to be saved annually on operating costs.

TABLE II—COST COMPARISON

Conditioning Outdoor Air vs Recovering Air

Assumed Conditions

Cooling Season (10 hr day)	1,200 hr @ average ½ load
Heating Season (14 hr day)	3,000 hr @ 70% efficiency
Cooling Equipment installed	$300.00 per ton
Heating Equipment installed	$2.50 per 1,000 Btu
Power Cost	$0.02 per kwh
Fuel Cost	$0.08 per gal
Air-Recovery Equipment	$437.50 per 1,000 cfm

Per Annum Cost to Condition 1,000 cfm Outside Air

Cooling Equip.—2½ tons @ $300.00	$750	
Heating Equip.—80,000 Btu @ $0.0025	200	
	$950	
Power Cost—1½ cfm × 1,200 hr @ $0.02		$ 30
Fuel Cost—2½ gal × 3,000 hr @ $0.08		120
Water Cooling, Evaporation Loss & Pumping Cost		19
		$169

Per Annum Cost to Recover 1,000 cfm Recirculated Air

Air Recovery Cell	$138	
Shipping & Installation	40	
	$178	
Carbon Reactivation Service, Maintenance		$ 25
Shipping & Labor		8
		$ 33
Capital Cost Saving	$372	
Yearly Operating Cost Saving		$136

ELEMENTARY SCHOOL for Richfield, Minn., has extensive windows on south side to obtain natural light for classrooms.

Finger-Plan School Saves Light, Heat

Easily adjusted to the needs of students, a school building whose "finger-plan" layout results in lighting and heating economies has been put in service in Richfield, Minn.

Like most suburban areas of it located on the southern edge of Minneapolis, Richfield has been growing rapidly, leaping to its present estimated 20,000 population during and after the war. A new elementary school was a necessity—but it had to be be built within the financial limitations of the community.

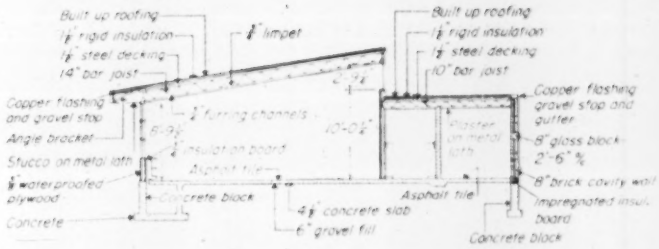
So the community called in the Minneapolis architectural firm of Long and Thorshov, Inc., to look over the situation and make recommendations. The problem was this: A central elementary school was to be built, to supply classroom and other needed space for a capacity of 510 pupils—six elementary grades and a kindergarten. Additionally, there had to be space for a library, kitchen, cafeteria-auditorium-gymnasium, offices, a health unit, and toilet and service facilities.

• **Results**—A study of the facilities to be provided, the site, the community, and most importantly, the need of the children for an environment that would provide a proper transition from home to school, resulted in a simple, well integrated, one-story structure. The total cost, including a septic tank sanitary system and a deep well but no landscaping, land and fees, was $410,325, or $0.83 per cu ft.

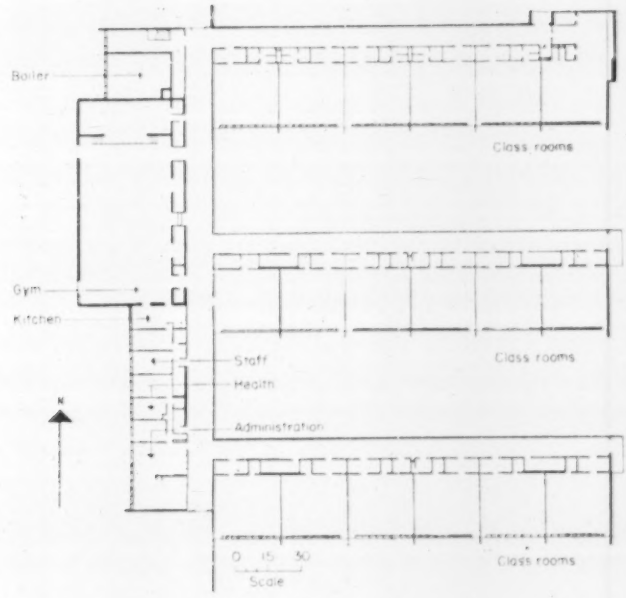
The building, this concrete-block foundation walls, standing in trenches dug by a trenching machine, and a concrete floor slab at grade topped with asphalt tile. The structure above grade is a light steel frame, with brick exterior walls, open-web steel joists and a standard built-up roof carried on steel decking. Doors and sash are of wood, windows are single glazed.

The building has a combined warm air radiation heating system, the air being circulated through ducts in the floor slab. The architects report that the average cost of heating the entire 58,300-sq ft structure is about $3 on a typical winter day.

Large window areas on the south side provide maximum natural warm light in the classrooms—light that may be controlled by venetian blinds. A continuous electronic unit on the north side adds to the natural lighting. Artificial lighting provisions include a continuous metal light cove with alternate 150-watt spots and 300-watt floods, fixtures being indirect.



DETAILS of construction show simple, cost-saving devices used to provide an acceptable, architecturally pleasing structure.



LAYOUT of the new school takes advantage of a roomy site to give each classroom proper orientation for light and integrates administrative sections.

Bay Outfall To Serve Six Cities

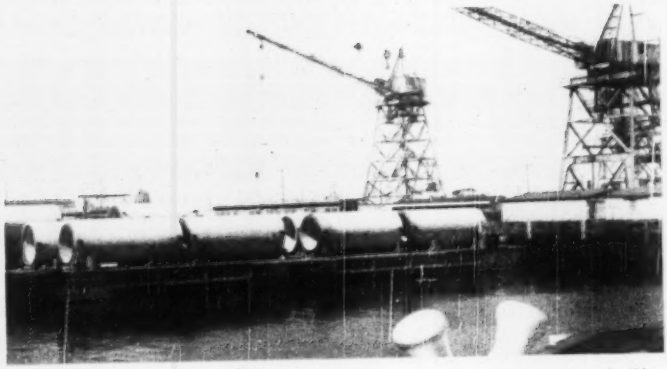


FIG. 4—PIPE IS LOADED on barges by revolving cranes at a wartime shipyard. This barge has ten 24-ft sections on it. Usual load is twelve. A barge fleet was required for the offshore work, including much barge-mounted lifting and digging equipment.

One mile under the sea and two miles under land . . .

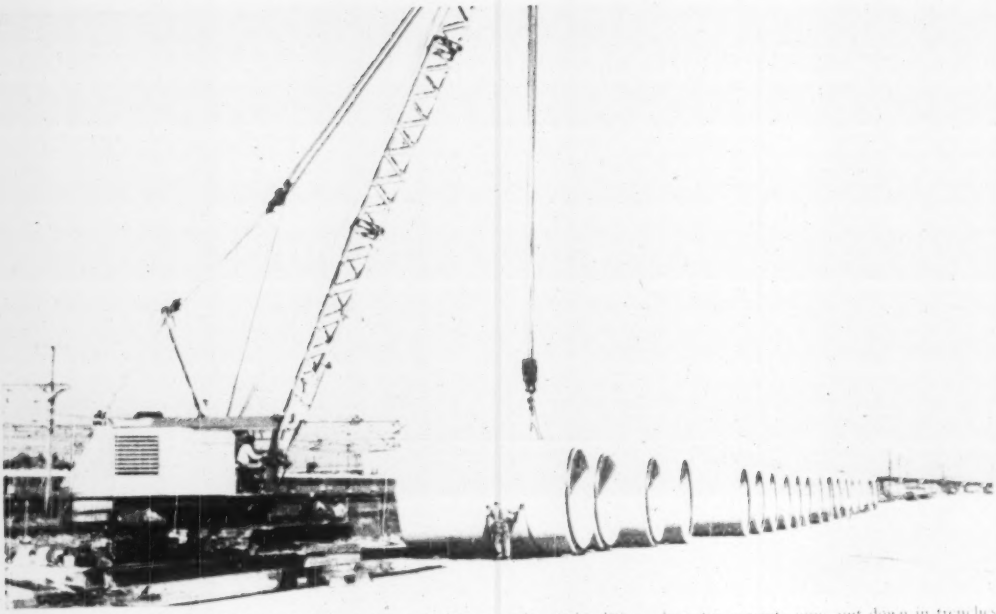


FIG. 5—THE LAND SECTION of the outfall line includes two miles of this 108-in. diameter concrete pipe, put down in trenches that had to be carefully built because of heaving of the soil and seepage from the bay nearby. Heavy wood sheating was put down before the pipe placement could start. Wood pile bents were driven to carry 18-in. thick concrete slab that supports pipe.

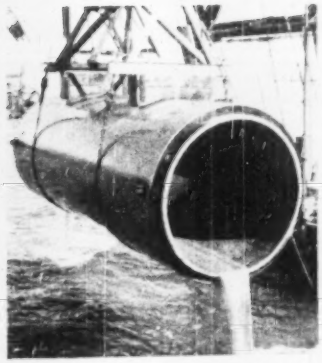


FIG. 2 OFF THE BARGE and into the water of San Francisco Bay goes a pipe section, ready for addition to the line.

FIG. 3 JUMPING into shallow water (up to 25 ft) divers worked on underwater sections. Four divers were used here.

FIG. 4 Joints on subaqueous sections include pivoted bolts for seating under water. Wood strips protect joint facing.

. . . new sewer outfall will serve six densely-populated communities on San Francisco Bay

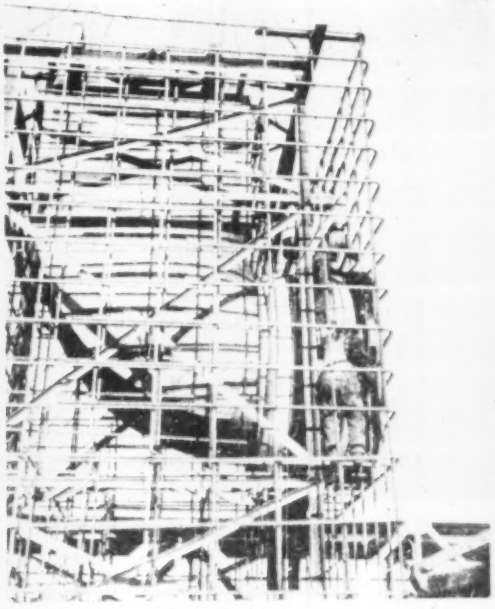


FIG. 6 FIRST PART BUILT was the transition section joining subaqueous and land portions of the line. The section was formed on a barge, poured under water.

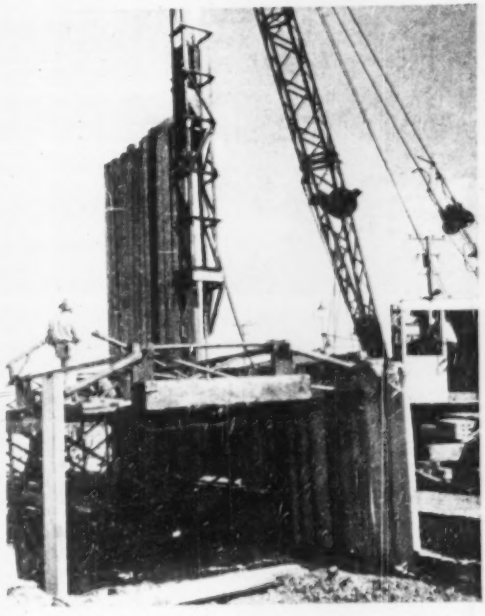


FIG. 7 TRENCH WORK on the land section was aided by a rubber-tire-mounted lagging frame to hold sheeting at accurate alignment until it was halfway down.

It will convey effluent from a primary treatment plant designed for 105 mgd average flow, which may eventually be expanded to 270 mgd capacity.

• Joint design—Most important design feature in such underwater out- falls is the joint between pipe sections, particularly where the line is exposed to wave or tide action. Leaky joints have made other outfall installations virtually useless.

In this case, the joint is a typical rubber-gasket type. But it includes added features that provide more positive closure and protect the pipe face at the joint.

On each side of each end of a pipe section is mounted an anchor block. Pivoted bolts are mounted on the anchor blocks at the bell end. On

the spigot end, the anchor block forms a receiving plate that the nut seats against. These bolts are tightened by divers using steam-powered ratchets. These bolted anchor blocks assure positive closure; this feature has not been used previously on a West Coast outfall installation.

Another joint detail involves redwood strips that are mounted around the face of the spigot end of the pipe to protect it from damage during seating.

The only criticism of the joint, noted in talking to the engineers and contractors involved, is that the lip of the bell end is short. A longer lip would speed up the construction rate, since greater care is necessary to make a watertight joint with the short lip design and any extra steps under water are time consuming.

In actual use, nuts on the pivoted bolt are fully seated. Then after two more pipe sections have been laid, the nuts are loosened two turns. This leaves the pipe positively seated but allows some shifting with moving ground, tide, etc.

• Pipe laid in underwater trench. The subaqueous section of the outfall is laid in an underwater trench for 4,500 ft of its 5,000 ft length. The bay bottom at this point is mud, varying in thickness from 10 to 20 ft, underlain by a firm sand layer. For 4,000 ft of the alignment this mud is only 10 to 15 ft below mean low water level.

A barge-mounted crane excavates the mud and, if necessary, the underlying firm sand to proper elevation. Where mud extends below the finish elevation of the bottom of the pipe, it is completely excavated and replaced with sand. Excavated mud is loaded into a barge and towed to another part of the bay for dumping. After the pipe is placed the trench is backfilled with sand.

Almost all of the pipe is laid at nearly level grade. Toward the end of the 5,000 ft section is sloped downward to obtain 20 ft of additional depth.

Pipe in 24 ft sections is manufactured by the United Concrete Pipe Corp. at its Stockton, Calif., plant. They are shipped to Oakland by rail and transferred to a tugboat, shipyard boat to storage cradle and then to barges. Shipyard cranes are available for this transfer operation.

Pipe laying is preceded by dredging inspection of the bottom to assure that if some additional material must be removed, a barge-mounted clam bucket equipped with bottom doors lays the pile and sidecasts spoil.

Another clam bucket with a backhoe part-time is used to pick the 50 ton pipe sections from the barge and then lower them into place. The pipe is slightly tipped toward the shore for better entry of the spigot end into the already placed bell end. Effective manipulation of the barge results in a fairly good seating of the pipe. However, the lines are not released until accurate line and grade are accurately checked by instrumentmen on the shore.

During all this procedure the barge on which the pipe-laying shear leg is mounted is securely anchored in place. Steam winches on the anchor lines maneuver it.

For final seating operations, three divers are required. Two contractor divers tighten the pivot mounted bolt nuts on each side of the pipes with steam-powered ratchets. While they are doing this an inspector diver inside the pipe uses feeler gages to determine adequacy of seating.

By these methods, average placement is better than two sections a day.

• Diffuser section. Another important design feature is the diffuser section located at the end of the outfall—one of the most extensive such installations ever made.

This section is 288 ft long and it involves thirty-six 16-in. dia openings on 8 ft centers for alternate sides of the pipe. The pipe size is reduced by steps from 90 in. to 78 in. to 60 in. to 42 in. All the diffuser section is bedded in crushed rock that is filled up to the spring line of the pipe.

This outlet section is located 40 ft below mean low water in a channel underneath the east (or cantilever) portion of the San Francisco-Oakland Bay Bridge. Flow tests indicate maximum dispersion at this point.

• Land section. The land section of the outfall is an entirely different problem. Because of the proximity to the bay, seepage and heaving ground are encountered requiring the trench to be sheeted prior to excavation. Wood piling consisting of two piles to a bent spaced on 4 or 6 ft centers is driven in the bottom of the trench.

The trench is backfilled with 6 in. of crushed rock topped by a minimum of 24 in. of sand. Next comes an 18 in. thick blanket of reinforced concrete. Great level of the wood piling is 12 in. below the surface of the concrete.

Next step is to cover the pipe. Here are laid 12x12 in. timbers on the reinforced concrete. Then comes an additional 12 in. thick and reinforced concrete cover and finally the pipe. To prevent seepage to the sand backfilled from the side after the pipe is laid, [illegible] on the land section is quite as important as on the subaqueous section, but considerable attention was devoted to them also. The cold joint involves straight metallic tape seating, using Carnegie shape M-5121, for the spigot end. A driven lead-fiber gasket on the inside seals the joint. Space between the pipe sections is grouted on the outside and painted on the inside to further seal the joint.

• Unique construction methods. Of interest on the construction of the land section are methods devised by the contractor to speed the work. Most interesting of these is a frame that holds about 20 lin ft of sheeting for driving by a crane-mounted pile driver.

The sheeting frame is supported on rubber tires that ride in steel channels. The channels are mounted on a timber frame and are accurately set to line. Beginning this way the contractor drives as much as 245 lin ft of sheeting on both sides of the trench in one day.

Sheeting is fed into this frame several sheets at a time by using a jig that clamps on to the upper end of such sheets. The pile driver crane lifts this jig and slips the sheets into the frame.

On the land section also, the contractor made good use of portable conveyor belts to place sand, crushed rock and concrete.

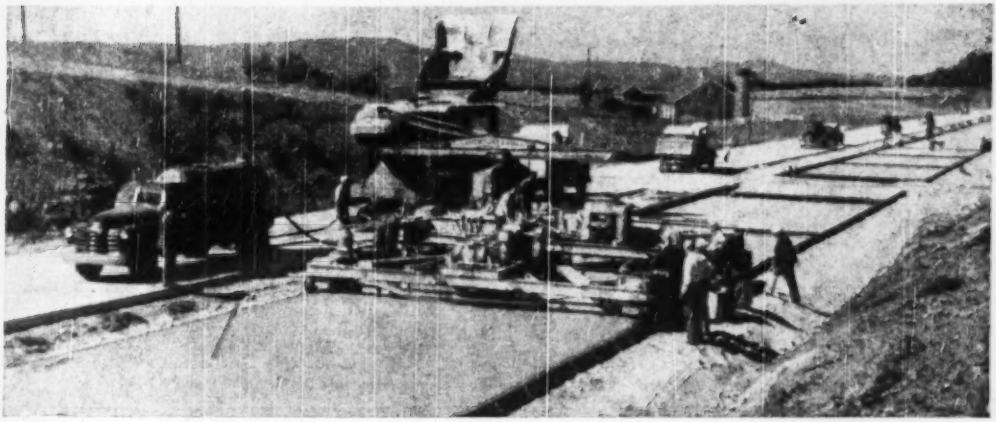
The 32-ton, 16-ft pipe sections were set by a crane that is much heavier than would normally be used. However, the contractor believed that he gained advantage by having more positive control of the work. This is borne out by production records—as many as 33 sections were placed in a single day.

The work is a project of Special District No. 1 of the East Bay Municipal Utility District under general direction of R. C. Kennedy, manager of sewage disposal engineering and construction. W. R. McLean supervises construction for the district and D. A. Root supervises design. Otto C. Bold is resident engineer on the outfall sewer.

Joint venturers on the land section under a $1,857,210 contract are Ben C. Gerwick Co., Inc., and Geo. Pollock Co., general contractors of San Francisco and Sacramento, respectively. M. Conlon is their job superintendent.

Contractor for the subaqueous section is Healy-Tibbitts Construction Co., San Francisco, under a $1,207,272 contract with work under general supervision of R. R. Helen.

Subcontractor for supplying pipe on both jobs is United Concrete Pipe Corp., Baldwin Park, Calif.



LONG-BOOM PAVER places 1,200 ft of 24-ft slab in 10 hours. Road will be open at end of 1950. (ENR photo)

Penn Turnpike Stretches East

Similar to original road built ten years ago, Philadelphia extension will cost 87 percent more per mile

IN THE YEARS 1938-40, the Pennsylvania Turnpike Commission built its original road, 160 miles long, for $184,000/mile.

Now, in 1948-1950, that same organization is building a 110-mile turnpike extension costing, to date, $362,000/mile.

Physically, the two jobs are alike. Design features and construction procedures are practically the same; a lower riding grade on the extension makes for earthwork volumes similar to those on the older route, which runs through rougher country.

Because the two jobs are so comparable, a quick calculation will show that to build a given stretch of turnpike today it takes 87 percent more money than it did ten years ago.

Though a phenomenal increase, this figure stacks up well against the ENR construction cost index, increase of 100 percent during the same ten year period.

Attending further comparisons, major unit price quantities were dug out for the same items for both jobs. These relative prices are tabulated.

The present job runs through rolling hills country, from the original job's eastern end, near Carlisle, to King of Prussia, a Philadelphia suburb. In March, a connection to Philadelphia was placed under contract by another agency. In the 100-mile length there are eight interchanges, 123 road and railroad grade separation structures, and 72 major drainage structures, including a 4,520-ft Susquehanna River bridge (ENR Feb. 23, p. 41).

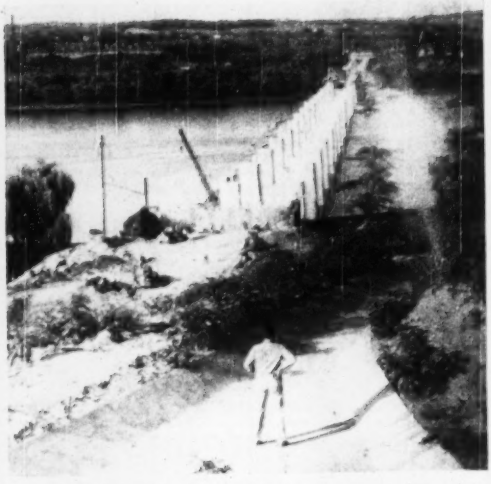
From an engineering standpoint, perhaps the most advanced techniques were used in preliminary investigations. After all, the original construction design was in many ways well ahead of its time. Aerial mapping helped the location (ENR July 8, 1948, p. 134), and a geophysical instrument obtained useful subsurface information. The instrument measured the electrical resistivity of the ground, according to concrete changes that indicated the location of groundwater and rock.

These two procedures speeded the job and reduced overall costs. The maps took five months to produce, about one-fifth the time needed for a ground-surveyed map. It cost about

TABLE I

Unit Prices from low bids on Pennsylvania Turnpike contracts, Ten Years ago and Today

Item	Original Turnpike 1938-40				Philadelphia Extension 1948-50			
	Total Quantity	Low	High	Average	Total Quantity	Low	High	Average
Class 1 Excavation	121,933,000 c.y.	$0.25	$3.00	$0.42	15,123,000 c.y.	$0.49	$1.04	$0.73
Class 2 Excavation	409,000 c.y.	1.20	2.50	1.69	945,000 c.y.	2.50	5.60	3.56
Subgrade	4,500,000 s.y.	.07	.20	.09	2,301,000 s.y.	.12	.30	.194
9-in. R. C. pavement	4,337,000 s.y.	2.35	4.00	2.74	2,003,000 s.y.	4.35	5.05	4.68
Reinf. Bars	22,692,000 lb.	.04	.095	.063	16,823,000 lb.	.09	.115	.102
Class A Concrete	24,000 c.y.	17.00	31.00	22.38	57,000 c.y.	37.00	53.00	48.20
Class B Concrete	159,000 c.y.	12.50	24.00	17.70	138,000 c.y.	25.00	42.00	37.40



SLOPE-SAVERS—For this heavy cut, engineers designed Berms (left) to resist possible slides and to provide access for maintenance machines. Paved intercepting ditches (right) from a berm and from top of cut join for carrying off surface water that otherwise would erode slope. Susquehanna River bridge work in background. (ENR photos)

one little, too. The subsurface investigations reduced the uncertainties in excavation costs and probably resulted in cheaper contract prices.

• **Design features**—As has been mentioned, design features are similar to those of the present turnpike. A typical 78-ft-wide graded cross-section carries 6 in of rolled pervious subgrade. Over the subgrade, two 24-ft concrete slabs are divided by a 10-ft grassed strip and flanked by 10-ft stabilized shoulders. The slabs have 9-in uniform thickness with a straight transverse slope outward at 2 in per ft. Pavement sections in 78-ft roadway are reinforced either with 3 gage 6 x 6 inch mesh and thinds and 3 gage 6 x 12 inch mesh middle thinds or with equivalent bar mats, either reinforcement placed 3 in from the top. One jack showed 3-in. preassembled transfer loads at expansion and contraction joints, at longitudinal construction joint also doweled.

Shoulders slope 1 in per ft and the median strip slopes to center drain at 1 in per ft. Maximum longitudinal grades are 3% and 40 maximum length. In cut, a concrete inlet feeds a transverse pipe to an open-jointed primary pipe in gravel-packed trench at the shoulder valley. In some places, a secondary valley drain runs on the other side of the road, feeding through transverse pipes to the primary. In fills, paved down-slope channels carry the runoff from transverse pipes. Fill and cut-side slopes are 2 on 1.

Alignment criteria include maximum curvature of 5 degrees, maximum grade of 2% (compared with 3% on original route). Minimum distance between spirals is 300 ft, and the design speed for curves is 60 mph. Minimum sight distance is 600 ft (for rear-end collision avoidance).

The sight distance requirement is taken into account for vertical curves as well as horizontal curves, the latter resulting in some curve daylighting (flattening side cuts instead of curves). Along the tops of high cuts, paved intercepting ditches are built to keep local runoff from washing down the slopes. One particularly heavy cut has berms to intercept possible minor slides, and to permit maintenance machinery access for those slides.

• **Construction procedures**—Anyone familiar with the earlier turnpike jobs (details described in ENR Sept. 28, 1939, p 396; July 4, 1940, p 25) would have little difficulty recognizing most of the procedures today.

However, in grading he would see several postwar makes of self-powered earth-moving scrapers for faster handling and an increased hydraulically operated boom-and-bucket that replaces a lot of finicky hand-shoveling.

And in paving he would see a finishing machine that spreads the concreting equipment, taking up the forms while it shapes the subgrade.

Otherwise, he would see the same tractor-and-scraper units, with their pushers, he would see bulldozers, graders, shovels, wagon drills, bursting bulls, heavy-duty pneumatic tampers. On concreting work, mechanical finishing machines, cement spreaders and dual-drum 34-E pavers. Some of these machines lead their test full-scale tests on the present job.

The major equipment lists of a few contractors illustrate the grading machinery story. (In general, contracts were let for grading and paving 4 to 5-mile sections of the job.)

• **Patterson Const. Co.**, Monongahela, Pa.: 4-7 mi-ton shovels, 9 tractor scrapers (3 self powered); 9 bulldozers; 14 heavy duty trucks and trailers; 1 crane; 5 rollers (1 sheepsfoot); 6 compressors; 5 wagon drills. (This is primarily a scraper job, in easy rolling country.)

• **H. J. Williams Co.**, York, Pa.: 4-3 mi-one shovel; 15 tractor scrapers (5 self powered); 2 pusher tractors; 7 bulldozers; 5 road graders; 1 rooter; 3 boom-and-bucket rigs; 4 rollers; 13 trucks; 5 compressors; 2 wagon drills; 1 crane. (This job is similar to and adjacent to the Patterson job.)

• **J. Robert Bazley, Inc.**, Pottsville, Pa.: 4-9 mi-ive shovels, 2 backhoes; 3 bulldozers; 13 compressors; 14 wagon drills; 33 large trucks; 6 rollers. (This is a shovel and truck job, with plenty of rock work.)

• **C. J. Langenfelder & Sons, Inc.**, Baltimore, Md.: 4-7 mi-ive shovels; 2 tractor scrapers; 1 rooter; 8 bulldozers; 3 graders; 13 heavy trucks and trailers; 11 compressors; 14 wagon drills; 5 rollers. (Although this job is in gently rolling country, rock occurs close to the surface in much of the length.)

• **Central Pennsylvania Quarry Stripping & Construction Co.**, Hickory,

Pa., 34 mix-in shovels, 1 back-hoe, 17 large trucks, 4 tractor scrapers, 7 bulldozers, 2 graders, 4 rollers, 10 compressors, 8 wagon drills. (This contract includes the heaviest single cut on the job.)

For excavation, volumes were figured in 1000-ft sections; cuts and fills not necessarily balanced. Contractors could haul, waste and borrow as they saw fit, in general making their own arrangements for borrow and spoil areas.

• **Job quantities**—Total grading quantities for the eastward extension include: Class I excavation, 15,100,000 cu yd; Class II excavation, 550,000 cu yd; borrow, 550,000 cu yd. Rock excavation amounts to about 30 percent of the total.

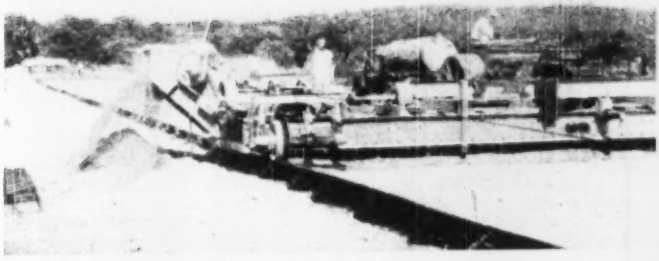
Reinforced concrete pavement (9 in.) totals 3,000,000 sq yd. In general, contractors chose to lay 12-ft wide slabs, although a few took advantage of long booms currently available for dual-drum 34E pavers, by laying 24-ft strips with approved dummy center joints.

The 24-ft arrangement is good for 1200 ft of road in ten hours. Contractors laying 12-ft slabs have made 3000 ft in twelve hours (one dual-drum 34E) and 2400 ft in seven hours (34E laying 6 in.; 27E laying 3 in. over reinforcement).

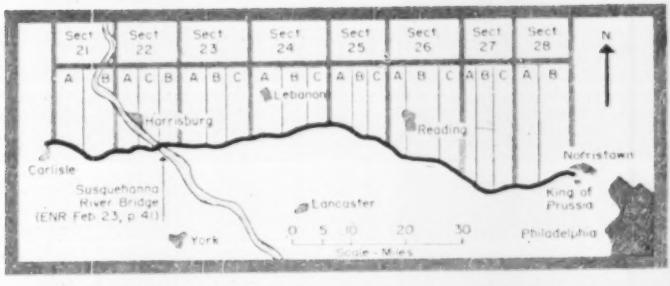
These performances are somewhat superior to those cited for the earlier job (ENR July 4, 1940, p 29). There, 2,026,416 of 24-ft slab was put down in 21 hours; one contractor averaged 225 ft or 12 ft per operating hour.

• **Job progress**—In all, there are 28 contracts for work on the eastward extension, including contracts for grading and paving in 22 sections. The first contract was let in November, 1948, and the last contract for grading and paving was let in September, 1949. Physical completion was set for April 1, 1950 with completion scheduled at the end of 1950.

Chief engineer for the Pennsylvania Turnpike Commission is Roger B. Stone; John D. Paul, assistant chief engineer; G. H. Rahn, materials engineer; R. J. Harper, general construction engineer. District construction engineers are G. E. Chapman, B. G. Erickson, and A. E. Cornell. Engineering for the work was performed by the following firms: Gannett Fleming, Corddry & Carpenter, Inc., Harrisburg; Modjeski & Masters, Harrisburg; Capitol Engineering Corp.; Dell-Eng. (Pa.); Parsons, Brinckerhoff, Hall & Macdonald, New York; Michael Baker, Inc., Rochester, Pa.; J. E. Greiner Co., Baltimore, have been consultants to the commission continuously since 1937.



MECHANICAL FINE GRADER, a postwar road machine in wide use on the Philadelphia extension, rides on pavement forms ahead of concreting, shaves last fractional inch from subgrade. Another new aid to fine grading (shoulders, ditches, side slopes) was an all-hydraulic excavator with a small trimmer bucket at the end of a telescopic boom. (Pa. Turnpike Commission photo)



TURNPIKE CONTRACT SECTIONS on eastward extension, from present terminus at Carlisle, to King of Prussia, Pa. Public highway connection to Philadelphia now is under construction. Sections and their subdivisions are referenced to contract lengths, costs and contractors listed in table below. Contract lengths range from 1.67 mi to 8.53 mi.

TABLE II

Major Road Contracts — Pennsylvania Turnpike Philadelphia Extension

Section (see map)	Length (mi)	Est. Price	Contractor
21-A-1	1.67	$1,319,803	Frank Martinelli Co., Pittsburgh
21-A-2	4.853	1,344,243	Lewis Bailey Inc., Pottsville
21-B-1	4.355	2,520,076	Warren, Drake & Piper, New York
21-B-2 & 22-A-1	5.380	3,282,536	Central Penna. Quarry, Shippens & Const. Co., Harleysville
22-C	3.28	2,361,275	Date
22-B	3.24	1,884,192	Empire Const. Co., Monongahela
23-A	4.56	2,584,898	H. E. Lauer Felder & Son, Inc., Baltimore
23-B	4.31	1,766,015	H. E. Williams Co., Inc., York
23-C	4.00	1,660,875	Empire Const. Co., Monongahela
24-A	5.33	3,181,208	Hanson Const. Co., Pittsburgh
24-B	4.36	2,763,554	C. W. Good Inc., Lancaster
24-C	3.20	1,801,313	John H. Swanger, Inc., Lancaster
25-A	4.89	2,548,768	H. E. Williams Co., Inc., York
25-B	5.72	3,869,924	Ralph Myers Const. Corp., Salem, Ind.
25-C & 26-A	8.53	4,602,735	C. W. Good, Inc., Lancaster
26-B	6.43	3,797,356	Empire Const. Co., Cameron
26-C & 27-A	7.49	3,767,788	C. H. Lauer Felder & Son Inc., Baltimore
27-B	3.825	2,909,711	S. J. Groves & Sons Co., New Milford

Power Station of Radical Design Proposed for El Salvador

Kenneth L. Sorensen
Harza Engineering Company, Chicago, Ill.

AN UNDERGROUND POWER STATION incorporating a radical departure from normal practice in the placing of the hydraulic turbines is to be built soon on the Lempa River in El Salvador, Central America.

These turbines are to be placed directly under vertical penstock shafts, with their drive shafts horizontal instead of vertical. The arrangement is expected to result in large economies in the design and construction of the plant.

The plant is being built for the Comision Ejecutiva Hidroelectrica del Rio Lempa, an autonomous agency of the government of El Salvador. It is located at the Guayabo Rapids, from which it will take its name, about 55 kilometers northeast of the capital city, San Salvador, where there is a demand now of 55,000 kw. The Guayabo project is the first step in a program for development of the power potentialities of the Lempa River to meet the country's need for electric power.

A low dam a short distance above the rapids will form a reservoir that will store 177,000,000 cubic meters (144,000 acre-ft) in the upper 15 meters of depth. This will be sufficient for a regulated flow of 42 cubic meters per second during the driest season and 46 cubic meters per second (1,630 cfs) in an average year. In addition it is planned to develop a natural lake, Lagunet Coapa on the headwaters of the Rio Lempa, for a somewhat greater volume of additional storage.

• **General plan**—The general layout is shown in Fig. 1. The dam will be a concrete gravity structure about 64 meters high and nearly 500 meters long, with a spillway in the highest portion across the river channel controlled by seven radial steel gates each 12 m high by 12.4 m wide. A very extreme flood will also overflow through a valley to the northward where an earth fill "fuse plug" is provided. The total flood capacity of the gates and the "fuse plug" section is 15,500 cubic meters per second (650,000 cfs).

To the right, or south, of the spillway will be a concrete gravity wing dam extending to high ground, and on the left, or north, of the spillway will be the intake structure forming a part of the dam. This structure will contain trash screens and steel intake gates which shut off or admit water, as required, to vertical shaft penstocks with steel liners leading downward to the hydraulic turbines.

The underground power station will occupy a chamber excavated in rock directly below the intakes. Except for the horizontal setting of the power units it will be similar to the underground plants in Europe that aroused so much interest among the American engineers who attended the Contes-

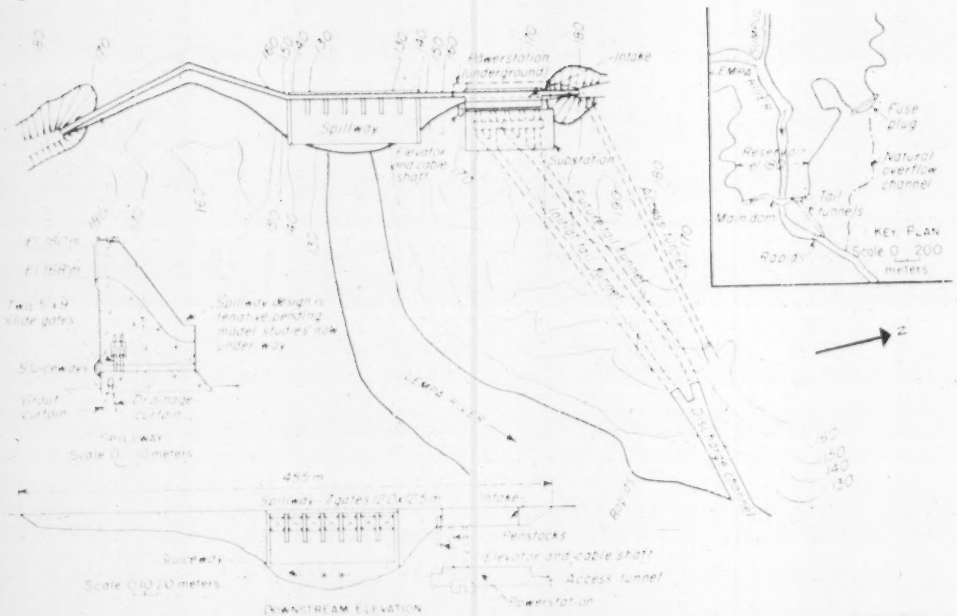


FIG. 1. THE GUAYABO POWER PROJECT in El Salvador is to be located above a rapids on the Lempa River where sound rock favors the use of an underground power station.

ence on High Dams in Stockholm in 1948. But those stations almost universally follow the general vertical unit layout of conventional surface power houses.

• **Advantages of design**—The Guavabo power station will depart from this practice with several obvious advantages by using horizontal units as shown in Fig. 2. The advantages are:

1. The power station chamber will be only slightly over one-half as high (and of about the same width) as required for vertical units, thus greatly reducing excavation.

2. The elbows in the penstocks ahead of the turbines required in vertical units are eliminated and the penstocks enter the scroll cases tangentially without elbow bends.

3. This setting permits the use of a straight conical draft tube of simpler construction than an elbow tube.

4. The absence of penstock elbows and of the elbow draft tubes will contribute toward higher efficiency and smoother operation. The length of a horizontal conical draft tube is not a matter of great concern as compared with vertical units because it is in the direction of, and in lieu of, an equivalent length of the required tail tunnel.

5. The time of construction will be materially shortened. Instead of some 16 or more pours of concrete from foundation level to generator floor, the generator can be bounded nearly on bedrock after only one or two pours of concrete. Turbine embedded parts can be erected through the penstock shafts. Turbines and generators can thus be installed simultaneously.

6. By using an intermediate section of shaft it can be so arranged that the removable parts of the turbines can be taken out without disturbing the governors.

7. Danger of cavitation and pitting will be almost eliminated.

• **Disadvantages**—The only apparent disadvantage is that turbine assembly parts will need to be moved horizontally for assembly or for dismantling without benefit of the crane. For this purpose special handling devices will be required which will permit the turbine parts to be moved out to within reach of the main crane. The turbine approach tunnel can be of gothic section with high enough arch to accommodate an overhead rail or beam with chain blocks; a special crane or dolly can be provided to run on rails under neath the shafts or the entire head cover assembly with runners can be designed with its own wheels attached to integral brackets and travelling horizontally on rails embedded in side walls of the access tunnel.

Alternately, the turbine approach tunnel could be eliminated and the turbine head cover set substantially flush with the generating room wall but this would require the penstocks to be embedded in vertical grooves in the rock wall and thus interrupt the continuity of the support of the roof arch and otherwise complicate the structure.

This type of power station, because of its low elevation relative to tailwater, would not be practicable for an outside or surface powerhouse with a great tailwater rise (in the case possible "0 ft") as it would be too costly to design the exposed building against outside pressure. But this objection does not apply to the underground chamber for which the natural rock forms the support. Only the tailgates would be directly exposed to the high tailwater and they are at the same elevation as with a conventional vertical unit. The turbine head cover is the only power station surface directly exposed to water pressure, which would also be the case with a vertical unit, the pressure against it when operating being a compromise between headwater and tailwater, and when idle, equal to tailwater.

• **Equipment**—The power station will be equipped initially with two horizontal-shaft Francis turbines fed through the vertical penstocks described above, driving two horizontal generators, and with extra floor space for erection and dismantling, switchgear and operating room. The turbines will be rated each at 21,000 metric horsepower at a head of 164 ft or 50 meters. The generators will be rated 15,667 kva at 90% power factor, 200 rpm, 60 cycle, three phase. Five such units are planned ultimately.

The Guavabo station will generate, with the initial two units, a normal capacity of 30,000 kw, decreasing to about 26,000 kw when drawn down to lowest elevation for useful storage.

The two horizontal conical draft tubes discharge into each tail tunnel about 280 meters long followed by open cut for about 70 meters. The net head will vary from about 56 meters (184 ft) at full reservoir and full load flow down to about 41 meters at low reservoir elevation. Access to the power station will be through an elevator and cable shaft at the intake and an inclined tunnel.

The commission that is building the plant consists of five members: Victor Manuel Valdes, president; Victor D. Sola, Roberto Dueno, Jose Cuellar and Jacinto Cuellar. Sr. Valdes, Cuellar and Cuellar are engineers. Consulting engineers for the design of the plant and supervision of the construction of the project and initial operation of the plant are the Hazza Engineering Company of Chicago.

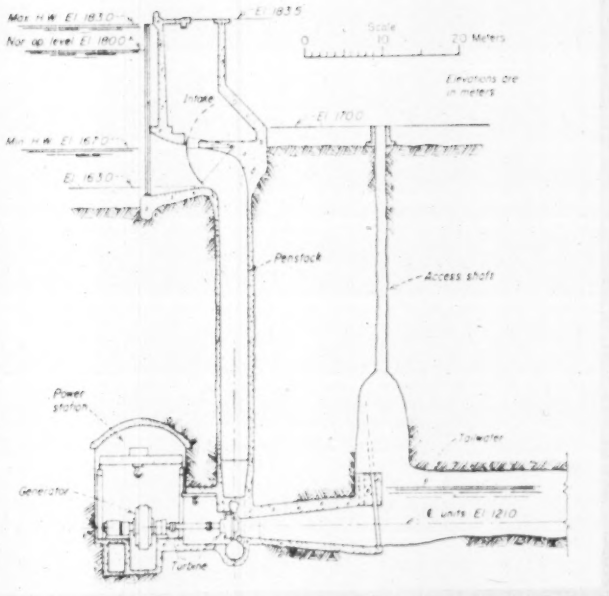


FIG. 2. NOTABLE IN THE LAYOUT of the underground Guavabo power plant is the horizontal placing of the turbine and generator.

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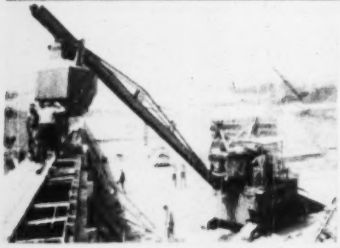

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READER COMMENT

Prior Claim

Sir: I have just read, in the July 7, 1949 issue of the Engineering News-Record, the article of Gerald Bowen entitled "Mirrored Model Gives Slab Moments."

As a matter of record, I expanded the principle of this method in *January, 1940*, in the "Annales des Ponts-Chaussees."

P. Dante
Provins, (Seine et Marne) France

Correction: Bridge Cost $6.14 per sq ft, not $11.25

In the article "Bridge Built for $11.25 Per Square Foot" (ENR May 18, 1950, p 45), the editors wrongly computed the square foot cost from the linear foot figure that was supplied with the information on which the article was based. This linear foot figure was $135, and for the 22-ft wide deck that would be $6.14 per sq ft, not $11.25. Our apologies to B. Loyal Smith, the engineer of Walla Walla County, Wash., who gave his constituents a truly low cost bridge.

Avoiding Blast Claims

Sir: E. J. Crandall's article "Will My Blasting Damage Property?" (ENR May 4, p 56) recommends that the adjacent property owner should be warned in advance that no damage will result from proposed blasting operations. I have found that a better procedure is to show him in advance how much damage his building has already sustained from other causes.

Some years ago, a nearby municipality built a new intercepting sewer through the city and I was engaged to appraise the large number of claims for damage caused by blasting that were made against the city.

Most of these claims were for cracks in foundations and in plastered walls and ceilings. It was evident in most buildings that the defects complained of were old cracks that had appeared a long time previous to the blasting operations.

I then suggested to the city officials that on future work of this sort, it would be wise to inspect all adjacent buildings BEFORE blasting was started and to prepare a schedule of such defects.

In many cases where this was done, I was assured by the building owner that there were no cracks in his building. He was surprised when I pointed out small settlement and shrinkage cracks in cellars, plaster cracks in ceilings and around doors—cracks that he had never noticed before.

When blasting is done, the building owner hears and feels the shock. He then inspects his building and discovers, for the first time, a number of cracks. He naturally ascribes these to the blasting work and, in good faith, files a claim accordingly. In the cases where a preliminary survey had been made, no claims resulted.

Lester H. Allen
28 Bowdoin St.
Newton Highlands 61, Mass.

Reuse of Soil Samplings

Sir: In your issue of January 26, p. 11, is an editorial entitled "Controlling Soil Compaction," which points out the disadvantages of re-using soil samples.

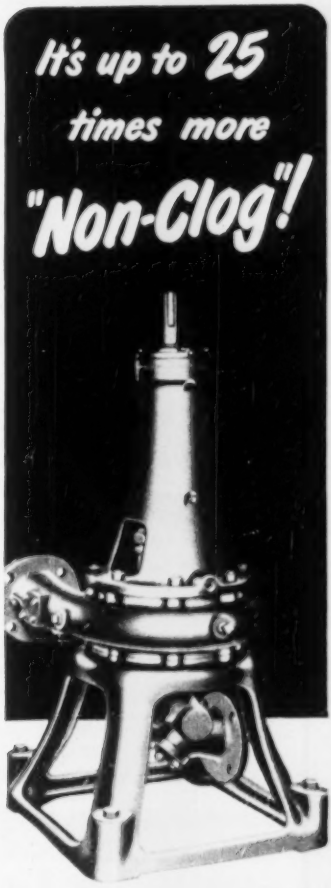
The common practice of reusing a single sample of soil for the determination of the moisture-density relationship has been opposed by the writer for a number of years. The practice of the State Rivers and Water Supply Commission of Australia, as developed by the writer, was set out in a publication in 1944 which was revised in 1945 and issued as a "Handbook of Methods of Testing Soils as Practiced in the Soil Mechanics Laboratory." The following statement appeared in that handbook: "Soil which has been compacted should not be broken up and used again. With one study soil, variations in the dry density of up to 3 lb per cu ft were found between compactions on original and recompacted samples, which were due to crushing down of the soil particles during compaction." It is of interest to note how closely this agrees with the findings that were discussed in your editorial.

Our handbook was printed by the Government Printer and a few copies were distributed by the Tait Book Co. of Melbourne but, unfortunately, distribution was not wide enough to have had our findings come to the attention of more engineers in the United States.

J. MacNeil Turnbull
Engineering Research Branch
State Rivers and Water Supply Comm.
Melbourne, Australia

Correction

In the drawing of the South Hadley Bridge underpinning job (ENR April 27, p. 41), caisson dowel bars were stated to be ¼ in. square. The bars are 1¼ in. square.



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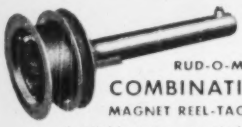

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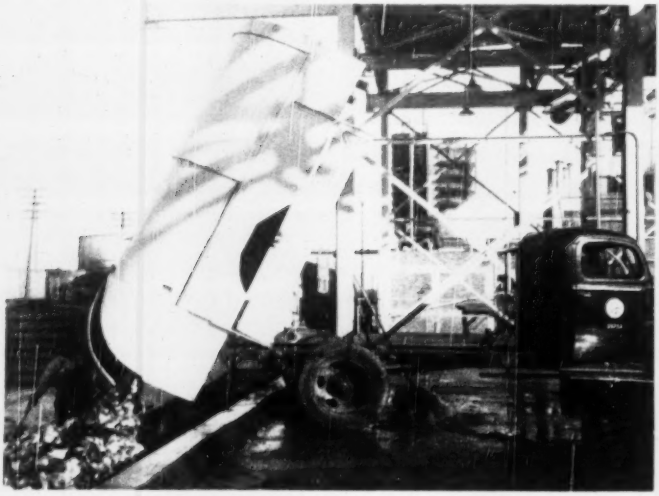

COVERED GARBAGE TRUCK—New covered garbage trucks used by Los Angeles have rear door which opens automatically to dump garbage at disposal area when bed is lifted by electric hoists. Old truck beds were retained, and cover was made from #20 gage sheet steel. Double door on either side of cover slides back to allow collection. Sprinklers installed under cover wash interior after dumping. Trucks hold 4.6 cu yd of refuse—about the same load carried by uncovered trucks. Railway cars carry garbage from disposal area to hog farms (ENR Apr. 13, 1950, p 38). (J. Joseph photo.)

Plane Table Pointer

A field procedure known to experienced plane table men but mentioned only briefly in surveying texts eliminates an awkward problem in the use of the alidade. When sighting an object to be located, one edge of the alidade should pass through the plotted point over which the table is set. Considerable juggling is required to keep the blade in this position while turning it for line. A pin stuck in the paper will serve as a pivot but will make a notable crater in the paper.

A simple solution consists of laying the alidade reasonably close to the plotted station and pivoting as necessary for sighting. Then by means of two triangles, one parallel to the edge of the blade, pivoted through the station. A ruler or sliding parallel rule can be substituted for the alidade. Blade itself can be used but is awkward and parallelism

TWO TRIANGLES transfer line of sight to plane table sheet, save time consuming alidade jockeying without introducing undue error.

suggested merely enlarges an error built into the equipment.

For stadia distances read to the nearest foot, an angular accuracy of two minutes is sufficient. Placing the alidade six inches off the point for a 50-ft sight roughly maintains comparable linear and angular accuracy since one minute equals about 0.05 ft at 100 ft. For shorter sights the alidade blade should be closer to the point representing the station occupied. Russell C. Bunker, University of Southern California, Los Angeles.

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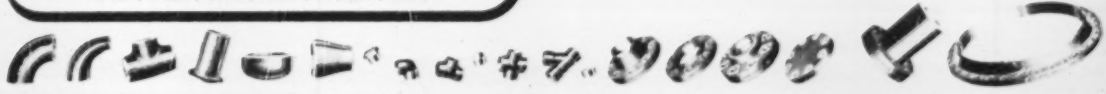
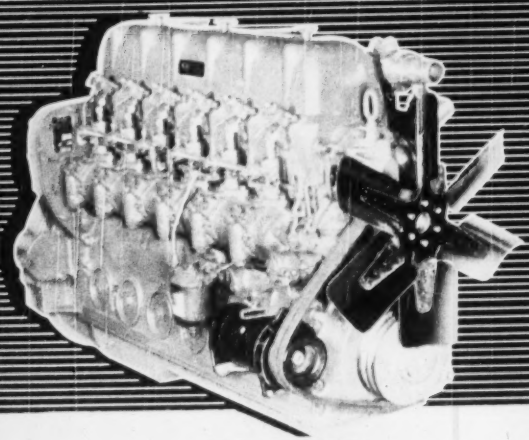


simplified design



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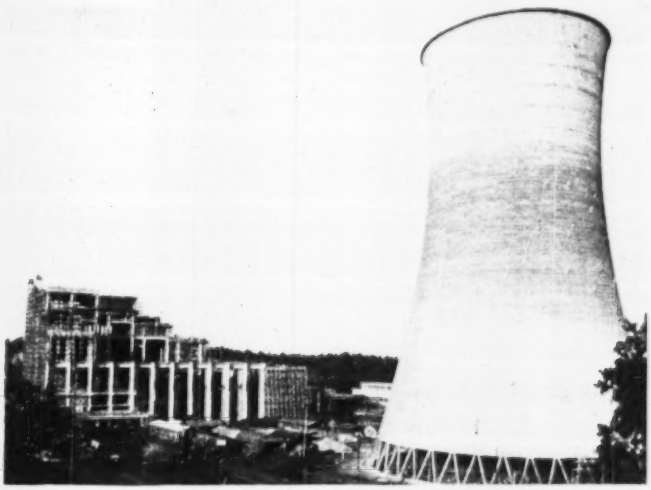


MORE POWER FOR FRANCE—The funnel-like structure in the foreground at Carling, in northeastern France, is one of the four towers through which water from steam condensers will pass to be cooled for re-use. Each tower is to be 280 ft high and 197 ft in diameter at the base. The powerhouse will be 427 ft long, 135 ft wide, and 162 ft high, constructed entirely of reinforced concrete.

Carling thermal station to be largest in Europe

The French have begun building the largest thermal power station in Europe at Carling in Lorraine. When completed, it will burn more than 7,000 tons of coal per day, and eventually it will produce upwards of two billion kwh per year.

The Carling power station eventually consists of four 100,000-kw capacity generating units. Work is well under way on two of them. The first of them, it is expected, will go into action by the end of this year; the second one early in 1951. When finished, this station will generate more power than France's famous Genissiat Dam, and as much as the giant Donzere-Mondragon station.

Carling was chosen as the site of this development because of its proximity to the coal fields of Lorraine. It is in the exact center of the pit heads of Merlebach-Cuvelette, Sainte Fontaine, La Nouve, Emilquemont and Folschviller.

This new power station is urgently needed in Lorraine, one of the recovered "lost provinces". Yearly consumption of electric power in the Lorraine Basin increased from 286,000,000 kwh in 1938 to more than 500,000,000 kwh last year. By 1952 consumption is expected to top 800,000,000 kwh, whereas present capacity is only about 525,000,000 kwh.

Simultaneously, coal output of the Lorraine field is skyrocketing. About 14 percent of it is fit only for generating power or similar uses.

Foreign Briefs

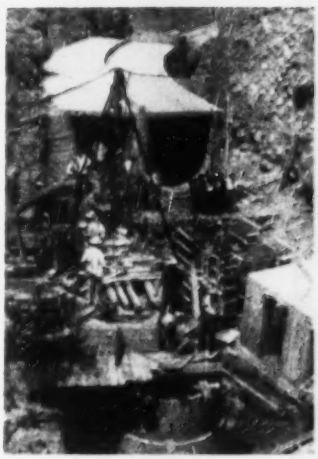
Venezuela airports—A multi-million dollar airport improvement and expansion program is well under way in Venezuela. It involves construction of a new, longer runway at Maiquetia, the international airport serving Caracas, and the building of the new Palo Negro airport at Maracay, which, it is said, may become one of the largest aviation centers in the hemisphere.

New paint remover—A paint removing device which Dutch engineers call brand new has been invented by Jan Prent, a public works official at Amsterdam. The open flame of the conventional instrument for burning down paint has been replaced in the Prent burner by a metal surface heated by the burning of propane gas in a closed combustion chamber. The paint no longer comes in contact with the flame. At demonstrations in Amsterdam, strips of nitrocellulose film were fixed over seams on the back of a wooden fence. An old type paint burner directed at the front surfaces of the fence had the strips afire in a fraction of a second. The Prent burner left the film unaffected after 15 seconds of use. The burner may be used on lacquers as well as on paint.

Aluminum prefabs—The Bristol Aeroplane Co. (Housing) Ltd. plans to establish assembly plants in Australia for its designs of aluminum prefabricated houses and schools. This was announced at Weston-super-Mare, England, recently when the first major consignment of 26 Bristol aluminum schools, part of an order for 100, left the factory for shipment to the government of Victoria. Bristol is shipping building components completely assembled, but the intention is to set up assembly plants in Australia.

Truck terminal—A group of truck and hauling companies has requested permission of the government to build a 10-story trucking terminal in Mexico City. The building will be on a site of several blocks on one of the main thoroughfares, Avenida Insurgentes. It would provide a central transfer point for the heavy flow of freight which comes in from the north and is shipped out to the south, east or west by different lines. Truck hauling constitutes a major part of the Mexican transport system and is growing with the continued expansion of the highway network.

(Continued on p. 52)

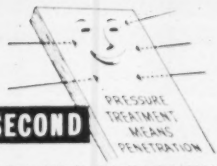


INFILTRATION GALLERY—Mountainous country traversed by the Lerma aqueduct to serve Mexico City with a new water supply from Lake Lerma offered opportunity to tap small streams enroute. Shown here is an infiltration gallery being constructed in an arroyo for this purpose. Some 200 engineers from all countries of Latin America, the Philippines and the United States inspected the work during the recent meeting of the Inter-American Association of Sanitary Engineering. The aqueduct, which is expected to be in full operation in 1952, is being built by Mexico City's federal district water department.

All engineers should know these facts about pressure-treated lumber

FIRST

PROTECTION—Treating of lumber preserves it—just as alloys preserve metals. The purpose is to protect lumber against costly rot and termite damage.



SECOND

PRESSURE TREATMENT vs. Surface Application—Authorities say that pressure-treatment provides the only *sure, lasting* protection to lumber.

THIRD

OTHER QUALITIES TO LOOK FOR—For greatest usefulness, preservatives also should be *clean, odorless, paintable, non-leaching* and *non-corrosive*.

For complete information about WOLMANIZED® Pressure-Treated Lumber, write for free booklet.

FOURTH

WOLMANIZED Pressure-Treated Lumber combines *all* these requirements—*lasts 3 to 5 times longer* than untreated wood, because it's treated under 150 lbs. pressure per square inch. Protection is deep in the wood fibers. It's clean, odorless, paintable, non-leaching, non-corrosive. Wolmanized Pressure-Treated Lumber has been proved in use for over 25 years. It will prove its value to you, too.

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Brazilian road show

Sponsored by the national highway department of Brazil, a road show is to be held in Rio de Janeiro, Nov. 12-30, 1950.

The management of the show believes that it will be a good opportunity for U. S. manufacturers to show their good will, the quality of their products, and their interest in the Brazilian road program.

The show will have the benefit of the advice, support and cooperation of the Pan American division of the American Road Builders' Association, and efforts are to be made to obtain import facilities from the Banco do Brasil and the customs authorities so that special treatment may be given to the materials, and equipment sent to the exhibit by American manufacturers.

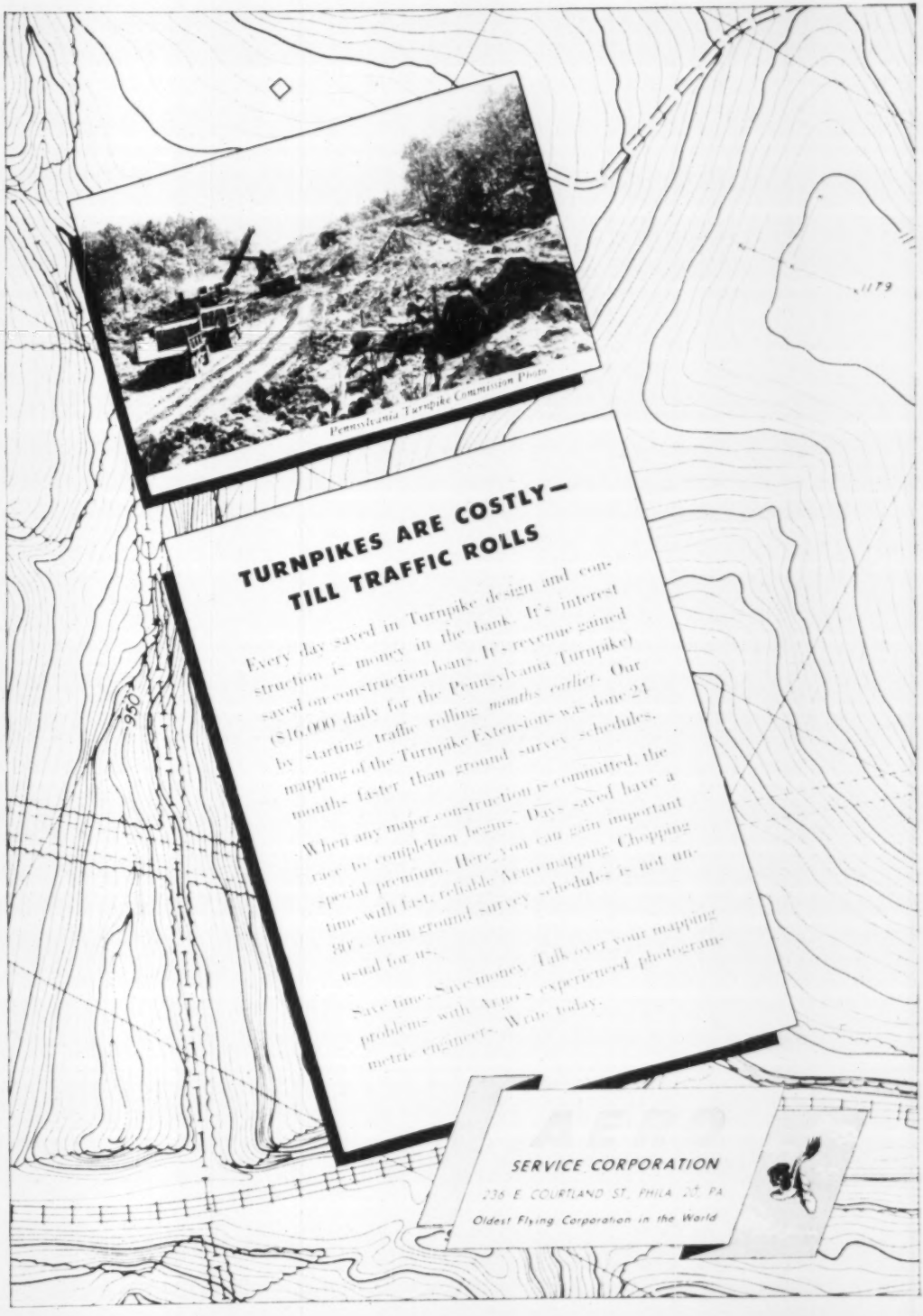
Foreign Briefs

New contracts for Americans—The British Minister for Works, Mines and Power has informed Parliament that preparation of the designs for the Hirakud Dam in the United Provinces of India has been entrusted to the International Engineering Co., Inc., of Denver, Colo., while a trial load analysis on the Kosi Dam has been entrusted to the U. S. Bureau of Reclamation.

Pierhead moved 9,000 miles—A 1,000-ton pierhead, once part of temporary invasion harbors, has arrived recently at Banka Strait, off the east coast of Sumatra, Indonesia, after having been towed by sea about 9,000 miles via the Suez Canal. Measuring 200 ft by 60 ft, it is now in use as a floating oil dock. The trip from England took 67 days. The motive power was the 2250-hp Dutch tug "Noord Holland."

Better roads needed—The need for a global movement for more and better roads was emphasized at the recent annual highway engineering conference at Ohio State University. Robert O. Swain, executive secretary of the International Roads Federation, said "There are hundreds of thousands of square miles of fertile lands throughout Latin America, with valuable timber and vast mineral deposits, that lie untapped because they are inaccessible."

Turkish irrigation—Ahmet Nevzi, Turkish engineer visiting this country, says that Turkey is trying to improve its agricultural production by modern irrigation methods, and is planning purchase of $500,000 worth of American drilling rigs and pumps.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Mister, you can pull out of almost anything! These babies have DUAL rear drives—and you can have 'em with an optional differential lock-out that assures you of pulling power as long as the two wheels of either axle have traction. And the differential lock-out, controlled from the cab, means no loss of power through slippage in mud, sand or slick, loose going.

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In hauling heavy equipment or materials to the job these same six-wheelers keep you within legal

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HOLLYWOOD FREEWAYS—At the left is Cahuenga Freeway entering Hollywood, Calif., connecting points to the north and points in the San Fernando Valley. It will join the new Hollywood Freeway in the northern area of the movie capital. The view at the right is along that unfinished parkway from Normandie Avenue to the Civil Center. Bridges in the foreground cross Normandie and Melrose avenues and underpass Vermont Avenue. So far the parkway has cost $37,000,000, with another $5,000,000 worth of contracts under way. Almost one-third of the 10-mile parkway will be in use by the end of the year, and it is expected that the entire parkway will be in operation by late 1952. It is a state project.—Wide World Photos.

New lighting installed for downtown St. Paul

St. Paul, Minn., has now put into service a new street lighting system as part of an extensive modernization program for 25 blocks of the downtown section. Local merchants have been active sponsors of the improvement program since it started in 1944.

The improvements included sewer enlargements, new paving, new scales which in some instances were widened one foot, making cross sections of 88 ft of paving and two 11-ft walks.

Before voluntary agreement merchants removed all overhanging signs, the city council then proceed to an ordinance prohibiting signs in that area extending more than 12 in. over the public sidewalk.

The St. Paul City Railway co-operated by removing its trolley cross span poles and attaching the wires to eyes in the walls of the buildings. New street lights were designed to be attached to the walls of the buildings so that all lamp posts might be removed from the curb line.

The wall-mounted luminaries were designed by the General Electric Co. and the Holophane Co. They are attached to the building 26 ft above the grade of the sidewalk and are spaced 60 to 78 ft along the street.

The lighting system was erected under the supervision of Harry C. Stroch, superintendent of lighting, Department of Public Utilities. The street and sidewalk work was carried out by Geo. M. Shepard, chief engineer, and the co-ordination of all these activities was handled by M. W. Thompson, secretary of the retail subdivision, St. Paul Association of Commerce.

The contract for the lighting amounted to $87,000, covering four street, for two blocks each. Other work done by the city in this section totals over $1,000,000.

Planning for 26 cities

British Columbia has a regional planning board which is working on a town plan for the whole lower mainland of that province. There are 26 member municipalities, each with one board representative, and municipal engineers act as advisers. The chairman is D. E. McGregor, chief engineer of the Fraser Valley Diking Board. The secretary is Tom M. Donald, regional supervisor of the Community Planning Association and chairman of the Vancouver Zoning Board of Appeal.

Prof. H. P. Oberlander of the department of architecture of the University of British Columbia at Vancouver, one of the authors of the town plan for London, Eng., is consultant to the regional planning board. Hans A. McCall, graduate and did post-graduate work at Harvard.

Municipal Briefs

Toledo expressway—A 5.4-mile, multi-million dollar expressway plan for Toledo, Ohio, approved recently by the Ohio highways department, has been turned over to city officials for their consideration by Howard, Needles, Tammen & Bergendoff, Kansas City, Mo., consulting engineers. The vast highway system designed to handle all traffic anticipated in the city by 1970, would cost a total of $67,000,000, the firm estimated. The project includes two new bridges over the Maumee River, one of which is a $5,000,000 four-lane North Toledo bridge, approved by voters last November. The bridge will be designed as the first link in the proposed Detroit-Cleveland by-pass, but also would give local traffic

Boston subways—The Metropolitan Transit Authority of Boston, Mass., will go ahead with two of its four construction projects: one for enlarging the Park Street-Scollay Square subway tunnel at a cost of $11,500,000, and the other a new subway between Washington and Dudley streets. A quirk in the law that authorized them will defer the other two projects—the subway between Haymarket Square, Boston, and Sullivan Square in Charlestown, along with demolition of the elevated structure between Dudley Street and Forest Hills.

(Continued on p. 58)

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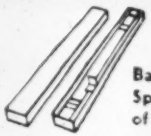

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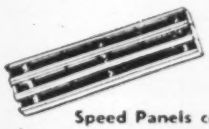

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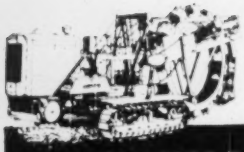

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Municipal Briefs

Erosion danger—Ocean wave erosion at Oxnard, Calif., in the last few months has washed out pilings and undermined the beach supporting that city's outfall sewer. Port Hueneme Engineer, D. A. Godshall says that since December, 1948, the beach next to the plant has receded 149 ft. and that unless something is done about it there is danger of the whole sewage treatment plant crumbling.

Off-street parking—The Massachusetts House of Representatives has given initial approval of legislation permitting the city of Boston to spend an additional $5,000,000 for off-street parking facilities.

Street improvements—Portland, Me., is ready to spend $500,000 on street improvements to tie in with the planned express highway through the city. State and federal agencies must first approve three construction projects outlined by the local public works department.

Double check on awards—A new division in the highway department of Boston, Mass., will give final approval on construction projects before awards are made. Called the "Finals Section," it will be headed by Charles Mattel, an engineer. All construction engineers will be under the supervision of George Bertini, in charge of lines, grades, and estimates. David O'Riordan will head all inspections.

Luxury hotel for Dallas—Conrad Hilton, well known hotel man, and eight businessmen of Dallas, Tex., have agreed to form a corporation to build a 500-room, $8,000,000 hotel in the downtown section of that city. Hilton described the proposed hotel as of the luxury type with meeting and convention rooms, a large ballroom, a fine restaurant and specialty shops. An executive committee of the chamber of commerce discussed finances with Mr. Hilton. The members of the committee are R. L. Thornton, Fred F. Florence, Ben Wooten, D. A. Hulcy, J. L. Lattimer, Stanley Marcus, John W. Carpenter, and George MacGregor.

Building boom in Topeka—The greatest construction program in the history of Topeka, Kan., is under way or planned for this year to cost upwards of $11,000,000. Increased population has forced the city commission to extend the city's boundaries and has spurred construction of new homes and additional public and business buildings. About half the new construction is for hospitals.

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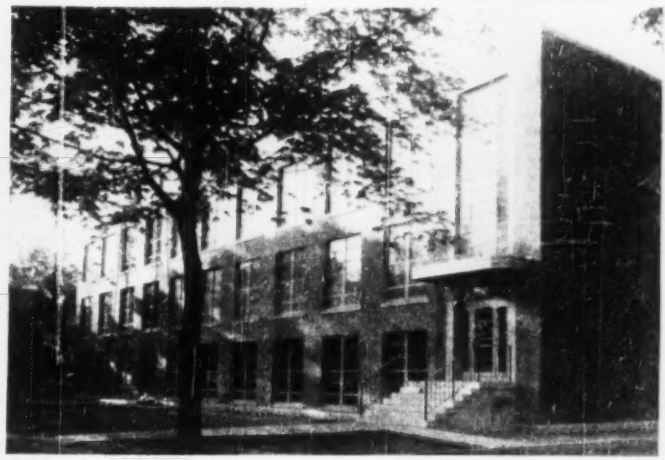

WATER SURVEY BUILDING—This new building on the campus of the University of Illinois is to be occupied by the Illinois State Water Survey.

Illinois Water Survey occupies new building

The Illinois State Water Survey, which was set by the Illinois General Assembly in 1895 to collect information on the state's water resources, has moved into its new home on the campus of the University of Illinois.

Extensions of the original studies by the survey were authorized by the General Assembly in 1897, 1911 and 1917. Arthur M. Buswell is director.

New C. E. Laboratories at Carnegie Tech.

The civil engineering department of the Carnegie Institute of Technology, Pittsburgh, Pa., is the first of several engineering departments to be moved to new laboratories, workrooms, and offices as part of a major building program. The department occupies about 25,000 sq. ft. in two wings of Industries Hall. The laboratories in hydraulics, structures, and materials, occupy four floors in one wing and the offices and classrooms occupy two floors of the other wing. The new construction features corrugated glass partitions, acoustic ceilings, and functional coloring in the laboratories and classrooms, and plywood paneling in the offices.

The laboratories and workrooms are designed for instruction and research as part of Carnegie Tech's plan of professional education in engineering and science. Full-time programs are offered at college and post-graduate levels, and part-time evening classes for graduates of high schools and colleges who are working with industries and engineers in the Pittsburgh area.

Some of the current projects include studies of bond stress distribution, reinforced concrete beams, a basket-handle culvert, effect of cold-working on fatigue strength of mild steel, some new hydraulic calibrating and regulating devices, and studies of bed scour, fluid turbulence, short conduits, and manifolds.

Webster N. Jones is dean of the college of engineering and science, and E. E. Mayo is head of the department of civil engineering. E. H. Miller, assistant controller of operations, supervised the new construction work.

Educational Notes

Women engineer—Mrs. Emma Frances Barnett, 27, is the first woman to be registered as a structural engineer in Illinois. The daughter of an engineer and a graduate of the college of engineering, University of Colorado, she is employed in engineering work by the city of Chicago.

Canadian engineers in Britain—A mission which has been touring Canada to promote public interest in use of British facilities for theoretical and practical training of engineers, covered the members of the engineering faculty in Canada by long distance to inspect the facilities. The touring party will comprise 11 engineering faculties members. The tour will last about six weeks.

Joint scholastic program—Oberlin College, Oberlin, Ohio, and Case Institute of Technology, Cleveland, have agreed on a joint plan to enable engineering students to acquire both Bachelor of Arts and engineering degrees by studying for three years at Oberlin, then another two years at Case. The plan will go into effect next fall.

Hydrodynamics—According to engineers at MIT, the use of interconnected electronic computers giving a television-like picture of water action may help make possible more efficient use of water and water power. One problem is the behavior of surge tanks, devices in most hydro systems to help eliminate changes in water pressure as gates and valves are opened and closed. It is hoped that studies will help determine the sizes and designs best suited to particular needs.

Applied mechanics—A professional engineering program in applied mechanics is being given at the Virginia Polytechnic Institute, June 14-22, and a graduate school through the summer. Special features include Sir Richard V. Southwell's course in "Relaxation Methods" and a "Symposium on Modern Developments in Design," in which the following engineers will participate: Prof. Hardy Cross, Yale University, M. Hetenyi, Northwestern; L. S. Jacobsen, Stanford; R. D. Mindlin, Columbia, and D. B. Steinman, consulting engineer, N. Y.

Disaster relief planning—Two-week training courses in disaster relief planning and operations are conducted during nine months of each year by the U. S. Naval School for Civil Engineer Corps officers at Port Hueneme, Calif. No courses are given in February, September and December. New classes convene the third Monday of each of the other months. During the first year, about 200 officers of the Naval Reserve took the training courses. Reserve officers usually come from engineering firms, contractor organizations or government engineering sections. The courses give training of value to the student both as a reserve officer and as a civilian concerned with the security of his home community. The Navy counts on comprehensive training in disaster relief as given at the school, supplemented by drills on the scale of the Los Angeles Citizens' Emergency Relief Corps, to be of great help in the event the overall

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lifts up to 29½' . . . reaches 31' . . . handles 7 tons with exceptional load maneuverability. Easy, finger-tip electric control of load hoist, and sliding boom on tilted track. Goes anywhere . . . on pavement, through sand, mud . . . handles structural work, unloads supplies . . . saves you time and money on every job. Quickly hooked up or uncoupled as needed.

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LETOURNEAU PEORIA, ILLINOIS JOB-PROVED Over 65,000 Built and Shipped TOURNAPULLS

MORE WORK PER HOUR WITH RUBBER-TIRED POWER

m.p.h. D TOURNAPULL

2 **BULLDOZER** on rubber-tired "D" gives you a 25 m.p.h., "drive anywhere" dozing unit for light clearing, backfilling, pusher-loading other "D's" in fleet operation. Husky 6'8¾" x 2'8½" blade has reversible cutting edge, replaceable tips . . . 3' blade lift . . . electric controlled. Operates independently of Carryall on rear. Bulldozer-Carryall combination often saves cost of an extra man and machine.

3 **9-TON TOURNAROCKER** assures steady, year-round profits . . . keeps "D" busy earning extra savings on your own jobs . . . good pay on sub-contracts or rentals. This new rear-dump hauling unit has 10 heaped yd., 9-ton capacity . . . low 7'0" loading height . . . 14' x 5" wheelbase . . . 12'2" turning radius. Simple, electric body hoist. Dumps clear over bank, tips vertical, cleans fast.

Tournapull, Carryall, Tournacrane–Trademark Reg. U.S. Pat. Off.
Tournarocker—Trademark ©129

6 **10-TON LOGGING ARCH** offers another profit opportunity for the 122 h.p. "D". Hoists, skids 10-ton log loads over rough terrain . . . big, low-pressure tires, and power-proportioning differential of primemover, provide easy-rolling flotation and constant-pull traction. Ample load clearance . . . 7' wide, 6'9" high inside arch. Can be used with Bulldozer on front . . . all electric control.

7 **10-TON TOURNAHAULER** Big 21'3" x 8'7" flat-bed hauls heavy construction, oil field, logging, mining equipment and supplies on or off highway. Loads itself by traveling overhead monorail, with 10-ton electric hoist . . . reaches out 10'1¾" beyond end of flat-bed . . . lifts load up to 12'1". One-man operated. Quickly pays for itself . . . easily interchanged with other units.

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- ☐ TOURNACRANE
- ☐ TOURNAHAULER
- ☐ LOGGING ARCH

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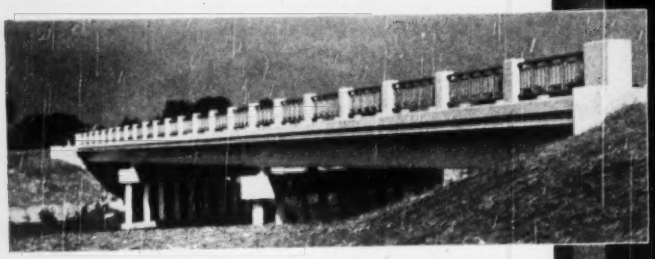

WHEN MONOTUBES GO IN!

Bridge on Ohio State Route 161, near Granville, with Monotube steel foundation piles. Another example of the adaptability of Monotubes for any type job.

YOU can check Monotubes, feature by feature—and you'll see how every one helps make important savings.

Take weight, for example. Although Monotubes are inherently strong, they're light in weight and easy to handle. That made it possible on a recent job for the contractor building an overpass to move in with a light truck crane, over a difficult access road, and within 2 hours start driving Monotubes!

And consider Monotube strength. In the job pictured above, single rows of Monotube piles form the piers . . . without longitudinal bracing. *Acting as columns*, these Monotube piles not only provided the necessary strength but saved approximately 90% of the concrete in solid pier construction. In addition, the fluted columns add to the beauty of the structure.

Here are *more* cost-saving, time-saving Monotube advantages. They're easily extendible. There's minimum cut-off waste. And, jobs started with Monotubes can be *completed* with them because they come in a range of lengths, gauges and tapers adaptable to varying soil conditions and different types of structures.

Get the complete story. See how Monotubes can help you design with certainty and save on foundation costs. For information, write to The Union Metal Manufacturing Company, Canton 5, Ohio.

UNION METAL

Monotube Foundation Piles

MEN AND JOBS

Lt. Col. Wright Hiatt has become deputy chief of civil works for flood control in the office of the Army Chief of Engineers. Maj. Gen. Lewis A. Pick, under whom he served in the building of the Ledo Road during the war, has been on the staff of the Engineer School, Fort Belvoir, since June, 1948. In his new post, he succeeds Lt. Col. Herbert C. Gee, flood control deputy chief since October, 1947. Colonel Gee resigned from the Army April 14 to enter private engineering practice in West Palm Beach, Fla.

Everett L. Setzer, of New London, N. C., has been selected to receive the annual award given to employees of the North Carolina State Highway Commission for meritorious service. A road foreman, he has been with the commission for 25 years and has designed and built three dryers for sand and other aggregates which cost only $250 each. The award is made annually as a memorial to the late D. B. McGuire, former chairman of the N. C. Highway Commission.

Thomas E. Huffman, of the Texas Highway Department, has become highway manager of the Dallas Chamber of Commerce. A district engineer for the state highway department at Tarkin, Beaumont and Dallas, Huffman became engineer-manager of Dallas Urban Expressways in 1945. **R. E. Killmer**, [illegible] partment, will be transferred from Beaumont to the Dallas expressways assignment. He will be succeeded as engineer for the Beaumont district by **William Edwin Simmons**, now assistant engineer. Huffman is a 1907 graduate of Ohio Northern University. Killmer holds a civil engineering degree from the University of Texas, 1915, and Simmons from Texas A. & M. College, 1922.

Harold B. McElwain, associate engineer in charge of construction for Rochester, N. Y., has been promoted to director of maintenance in the public works department. **Remington H. Kohler**, principal engineer, also has been given expanded duties.

Wilson V. Binger has joined Porterfield-Binger Construction Co., general contractors of Youngstown, Ohio, as vice president. He has also opened a consulting engineering office at 222 West Raven Avenue, Youngstown. He has been in Buenos Aires, Argentina, since 1948 as chief soils engineer for Parsons, Brinckerhoff, Hall, and Macdonald. He had previously been chief, soils and geology branch, Missouri River Division, Corps of Engineers, and chief, soils and foundations section, Special Engineering Division, the Panama Canal.

H. C. Clappison has been appointed [illegible] and general manager of

OUTFALL SEWER BUILDERS—Discussing details of the 3-mile-long outfall sewer (two on land and one under water) being built to serve Oakland, Calif., and nearby cities, are left to right: W. R. McLean, who supervises construction; R. C. Kennedy, manager of sewage disposal engineering and construction; John W. McFarland, acting general manager, and Otto C. Bohl, resident engineer on the outfall. All are officials of the East Bay Municipal Utility District. Photo was taken on the district's launch during an inspection trip of the work offshore in San Francisco Bay.

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with JAEGER pressure

125 ft. of 100 lb. air—Runs 2 heavy breakers or 1 heavy duty rock drill at full pressure.

175 to 200% more air @ 100 lbs. does 30% to 100% more work

It is important to you that, at full pressure, air tools hit enough harder and faster to do 30% to 100% more work than they do at the 70% pressure maintained by undersized compressors.

Jaeger "new-standard" ratings (the first increase in the industry since 1932) give you the air you must have to run today's tools at proper pressure and efficiency — 75 ft. of 100 lb. air instead of 60—125 ft. instead of 105—185 ft. instead of 160—250 ft. instead of 210—365 ft. instead of 315—600 ft. instead of 500. If this cost-saving interests you, send for Jaeger catalog J-8.

600 ft. of 100 lb. air—Runs 2 big wagon drills at full pressure, drilling 25% to 40% more footage than you can get with any 500 ft. compressor.

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Large, easily read pressure gage.

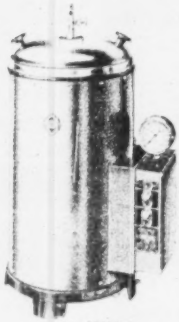
High pressure chamber, chromium plated for maximum corrosion resistance.

Built for complete safety.

Equipped with pressure safety valve.

In use in scores of cement laboratories since 1937.

Meets requirements of ASTM Standard Methods C151-43 and C189-44. For operation on 115 volts 50-60 cycles A.C. also available for 25 cycles.



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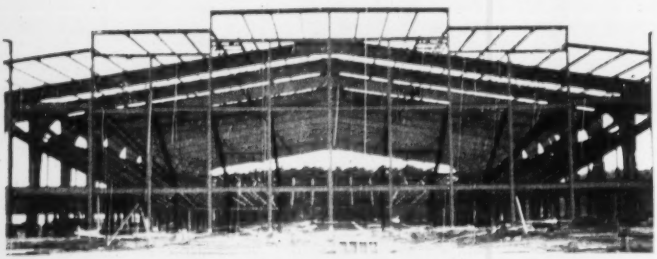

Specify Ingalls fabricated steel for that new stadium, office building, plant, warehouse—and you know the steel is fabricated **right** for maximum safety, permanence, utility and strength. For nearly half a century, Ingalls has served the nation with expert fabrication, erection and engineering service of structural steel, meeting the standards and schedules of industry's greatest names.

Whatever you may need in fabricated steelwork, contact Ingalls for fast, complete service. Five plants, complete engineering staff. Write for quotations.

Ingalls fabricated the steelwork for this new Coliseum, seating 14,000 persons, at the North Carolina State College, Raleigh.

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Frank Preston Eiler, engineer consultant to the division engineer, North Atlantic Division, Corps of Engineers, New York, has retired after 25 years. Much of his service was on studies of the St. Lawrence River project. Other assignments included development of the flood control programs on the Merrimack and Susquehanna River basins, studies of the Passamaquoddy tidal power project, and consulting service on the Buggs Island and Philpott multiple-purpose projects now under construction on the Roanoke River.

E. S. Hines Limited, Toronto, Ont., equipment distributors for contractors, logging companies and mines, M. Chapman is a civil engineer, a graduate of University of Toronto, and is well known in contracting and construction circles throughout Canada.

H. B. Hines, Sanford, N. C., civil engineer, has been named city manager there. He served as a lieutenant colonel in the war.

Arch Skeen, who has been associated with the Red River ordnance's water works department close to Texarkana, Tex., has been made superintendent of the city water department of Bonham, Tex.

E. D. Eaton, assistant director of operation and maintenance, Bureau of Reclamation, has been named acting director. He has been with the bureau since 1945. Before the war he was with the Soil Conservation Service in Albuquerque, N. M., and the west.

Geo. R. Halton, formerly design engineer, O. E. Porter & Co., is now a consulting engineer on earthworks, aggregates and foundation soils at 1060 Broad St., Newark 2, N. J.

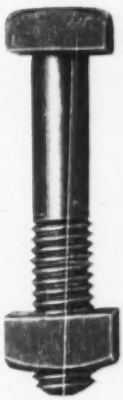
(Continued on page 71)

MUSCLE MEN . . . Serving the Nation Well

Judd Barner operates a Lorain Power Shovel for the Dallas County Road Commission, Fordyce, Arkansas. Says Judd: "It is a tough little machine and I enjoy operating it."

Men like Judd Barner who are helping to build a better America know that a machine —like a man—is only as strong as its muscles . . . which, in the case of Judd's shovel, are its fasteners.

To be sure its shovel will withstand the bone-rattling service Judd will give it, The Thew Shovel Company insists upon top-quality fasteners—which pay off in dependable performance out on the job.



John Waring operates a bolt-maker in RB&W's Port Chester plant. Automatic cold-heading, which RB&W originated, accounts for the superior strength, greater accuracy, almost perfect uniformity and improved appearance of RB&W bolts.

Here, and in other manufacturing steps, RB&W builds into its bolts and other fasteners the maximum soundness that enables them to resist the shocks of such service as Judd Barner and his shovel will give them.

Fasteners, which keep a product well-muscled, cost so little compared to the other components . . . isn't it sensible to specify the soundest fasteners?

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Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland. Sales agents at: Portland, Seattle. Distributors from coast to coast.

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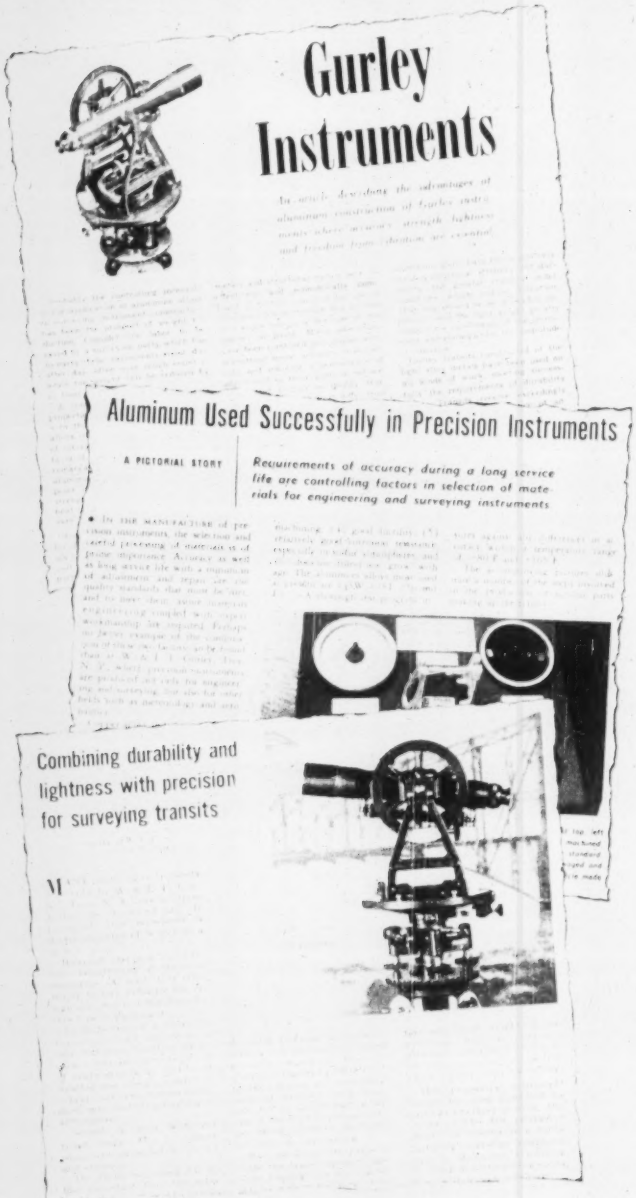
Engineers Confirm in the Field the Strength and Accuracy Technical Editors Found in Gurley Aluminum Alloy Transits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A PICTORIAL STORY
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Combining durability and lightness with precision for surveying transits

FROM AN EXPLORER:

"Have been using your instruments since 1906, which I purchased for surveys in Mexico—and they are as good as ever."

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"Your instruments can take it. I have been using a Gurley Transit here in Europe for the past year under the roughest kind of treatment and it is still in perfect adjustment."

FROM A COMBAT ENGINEER IN WORLD WAR II:

"I spent three years overseas as chief of a survey party. We were required to do very accurate work. We used Gurley 20-second transits and after being dropped and about everything else, they still did work up to par."

From the first model

built in 1876 and retired after 50 years of service, Gurley Aluminum Alloy Transits have met every field requirement for strength, lightness, freedom from vibration and permanent accuracy in heat, cold and the roughest treatment. For complete details about Gurley instruments, write for your free copy of Catalog 50.

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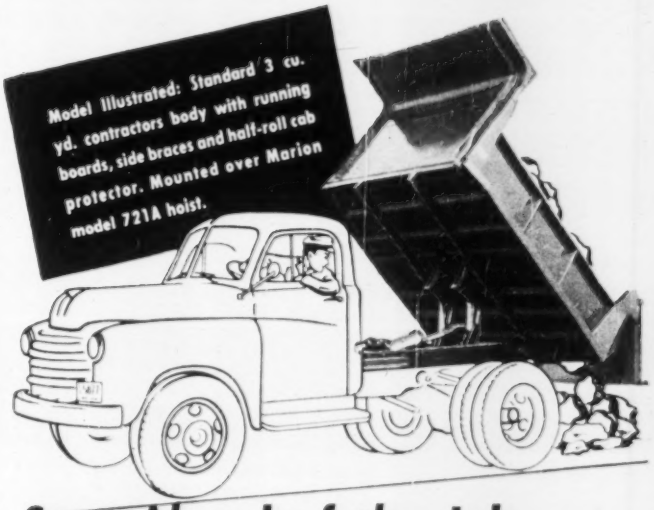
Surveying and Engineering Instruments, Hydraulic Engineering Instruments, Standard Precision Weights and Measures, Paper and Textile Testing Instruments, Kelvin Making Facilities, Aeronautical Navigating Instruments and Meteorological Instruments

Ernest Hillman, of the Los Angeles structural engineering firm of Hillman & Nowell, who was recently made president of the Structural Engineers Association of Southern California.

Alfred B. Lewellen, for more than 30 years an engineer with the United States Bureau of Public Roads, has retired. He served as engineer in charge during construction of portions of the Willamette and North Santiam highways in Oregon when they were built through the Cascade Range. During the war he worked on the Alcan Highway.

A. J. Haagen-Smit has taken a year's leave of absence from the California Institute of Technology to become director of air pollution research for Los Angeles County.

Pressure-grouting a 17-ft depth of subsurface strata of faulted shale, including an abandoned coal mine, to support the new 11-story Veterans Administration General Medical Hospital in Pittsburgh, Pa., is in charge of, left to right, J. P. Renouf, resident engineer, Corps of Engineers; Frank G. Cannon, Sr., president, Cannon Diamond Drilling Co., contractor on the $388,000 contract; and J. S. Minnotte, assistant chief, Construction, Pittsburgh District Corps of Engineers.


Model Illustrated: Standard 3 cu. yd. contractors body with running boards, side braces and half-roll cab protector. Mounted over Marion model 721A hoist.

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Every Marion unit is designed "On The Job" under actual working conditions. Faster loading and dumping . . . extra pounds on every trip . . . longer service life . . . are engineered into every Marion unit.

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Exploration for coal and other mineral deposits. Foundation test boring and grout hole drilling for bridges, dams and all heavy structures.

Core Drill Contractors for more than 60 years

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ELECTIONS AND ACTIVITIES

Cleveland, Ohio, Society of Professional Engineers has elected Paul A. Harlamert, president; C. Austin Beck, vice president; Fred Gaub, renamed treasurer; John Baiett, renamed secretary; and Sol Bauer, renamed historian.

Northwest Ohio Section, American Water Works Association, recently organized, has elected George J. Van Dorp, Toledo water division commissioner, as chairman; Pierce Bailey, engineer in the Toledo water division, secretary; and Ros Reilly, waterworks superintendent at Bucyrus, Ohio, program chairman.

Lt. Gen. Raymond A. Wheeler, engineering adviser of the world bank and former chief of engineers, was installed as president of the Society of American Military Engineers at the group's 50th annual meeting in Washington recently. Other officers for the year include Rear Adm. Lee Otis Colbert, retired director of the U. S. Coast and Geodetic Survey, as first vice president, and Comdr. John A. Volpe as second vice president. Continued in office are Col. E. Goring Bliss, treasurer, and Col. F. H. Kohloss, executive secretary.

Indiana Engineering Council, organized to coordinate the efforts of all engineering and technical groups throughout the state, has elected C. F. Switzer, Indianapolis, as president, succeeding Prof. H. L. Solberg. Col. Chester Lichtenberg, Fort Wayne, was elected vice president.

Charles D. Zacher was elected presiding of the Engineering Society of Buffalo at the annual meeting in Hotel Statler. Other new officers are Arthur L. Uhlandt, vice president; Robert K. McKeegan, Jr., secretary; George Nachbauer, treasurer, and Edward F. Kleindinst, George H. Schlaecker, Andrew O. Stalwell and Alfred K. Warren, Jr., directors for three years.

Elliott T. Dimock has succeeded Hans Gottlieb as president of the Trenton, N. J. Engineers Club. Other officers: M. J. Kinney, first vice president, N. V. French, second vice pres-

(Continued on page 74)

10,000 FEET MORE

of the modern main
that shortens the job
and lengthens the service

IT'S K&M "Century" ASBESTOS-CEMENT PIPE

The light weight of this strong K&M Asbestos-Cement Pipe cuts shipping and haulage costs sharply; permits of more economical laying equipment; saves many dollars' worth of time. Even when a radius requires as much as 5° deflection per pipe length, it is easily swung with the "Century" Simplex Flexible Couplings regularly used. This feature, in conjunction with lightness, speeds up any alignment needed before backfill.

Yet all of that merely begins the economies now winning increasing favor for K&M Pipe. This advanced pipe defies electrolysis and is highly resistant to soil corrosion. It doesn't know tuberculation effects; therefore, inside diameter, flow capacity and calculated pumping costs hold constant.

Traffic stresses, earth settlement and chemical attack are all minimized by K&M Asbestos-Cement Pipe — the main that the years don't weaken! As a final economy this pipe is recoverable for re-laying in its original pressure class. You can see why the savings made and the service-assured always do credit to those responsible for K&M "Century" Pipe installations. Write us for full data.

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Keasbey & Mattison has made it serve mankind since 1873

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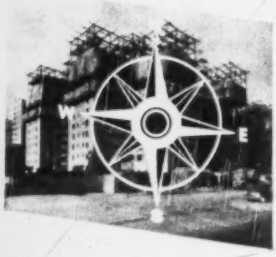

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STOP HEAT LOSS with KORK-PAK...the *INSULATING* VAPOR SEAL

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dent; A. D. Bullock, treasurer; and F. C. Claus, secretary.

James F. Salmon, New York manager of The Arundel Corp., has been elected president of The Moles. Ralph W. Atwater has been made life honorary president. Other new officers are R. V. Hyland, 1st vice-president; David Bonner, 2nd vice-president; Albert E. Downes, sergeant-at-arms; and H. P. Maxton, treasurer.

Clarence Burdick, superintendent of utilities at Grand Island, Neb., is president of the Nebraska chapter of the American Water Works Association. Other officers: Vice-chairman, Lon Wright; Roy Case, national director for Nebraska.

Toledo Chapter, Ohio Society of Professional Engineers, has elected Guy T. Nopper, Lucas County engineer, as president; C. W. Cisco, vice-president; Elmer R. Brigham, secretary; W. F. Kramer, treasurer; Charles A. Beam, Jr., Ralph S. Nopper, and W. H. Steinhauer, directors.

At its last formal meeting of the season, the Junior Branch of ASCE's Metropolitan N. Y. section elected the following officers: Arthur J. Fox, Jr., president; Edward Wesp, 1st vice-president; John F. Molloy, 2nd vice-president; Robert K. Lockwood, secretary; Paul W. Freitag, treasurer.

John W. Klag, commissioner of streets for Toledo, has been elected president of the newly-organized Ohio Association of Street Maintenance and Sanitation Superintendent and Commissioners. Others elected were Charles E. Brokaw, superintendent of highway maintenance for Cincinnati, vice-president; and Albert Peterson, superintendent of streets for Youngstown, secretary-treasurer.

MAJOR MEETINGS

Pennsylvania Sewage Works School, State College, Pa., June 19-23.

American Congress on Surveying and Mapping, 10th anniversary meeting, Hotel Shoreham, Washington, D. C., June 21-23.

Pennsylvania Water Works School, State College, Pa., June 26-30.

Ohio Sewage & Industrial Wastes Treatment Conference, Hotel Shoreham, Cincinnati, Ohio, June 28-30.

Annual Conference on the Small Community, Yellow Springs, Ohio, June [illegible].

American Society of Civil Engineers, summer convention, Hotel New Yorker, New York, July 10-14.

Pennsylvania Water Works Operators' Association, annual conference, State College, Pa., Aug. [illegible].

Here's a blueprint to LOW hauling costs!

DODGE trucks are "Job-Rated" for extra savings!

You can enjoy rock-bottom transportation costs and a healthier profit picture when you invest in a Dodge "*Job-Rated*" Truck.

You'll get a truck that's "*Job-Rated*" to provide peak performance at lowest possible cost on the toughest of assignments.

Its engine will be "*Job-Rated*" to give you power to spare with maximum gas and oil economy. Every chassis unit—practically every nut and bolt will also be "*Job-Rated*." That will cut your operating and upkeep costs.

Your Dodge dealer can help you bridge the gap between profits and losses by showing you a truck that's "*Job-Rated*" to your job. It will be "*Job-Rated*"! See him soon.

With all their extra value **DODGE** "Job-Rated" **TRUCKS** are priced with the lowest

REVOLUTIONARY NEW FIBRE FOR ROTARY POWER SWEEPERS

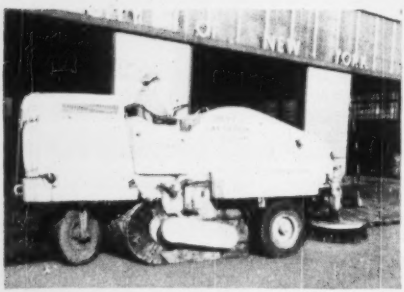
...makes all other fibre obsolete!

PERMENE *fibre developed by Modglin after 3 years research, outwears other fibre many times.*

Permene, the only fibre ever engineered specifically for rotary sweeper use, is the toughest, most durable, most efficient fibre in the world for its purpose.

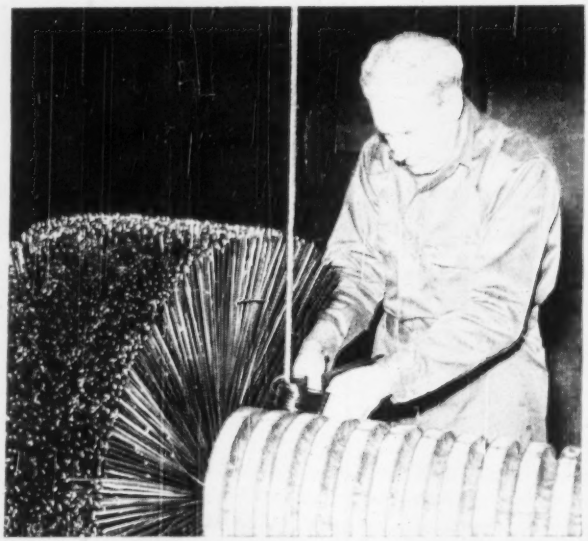
WEARS LONGER: Street tests by numerous cities, including Los Angeles, New York, Chicago, Glendale, Inglewood, and many others, have shown without exception that Permene outwears any other fibre *many times over.*

CUTS COSTS: Because Modglin Permene wears longer, expensive, frequent re-winding of brooms is eliminated. One city, by switching to Permene, cut the number of re-winding operations per sweeper from an average of 54 times per year to 12. Permene saves labor, saves cost of materials, saves tie-up of equipment.



The new Modglin Permene Fibre now being tested by New York City Department of Sanitation.

SWEEPS BETTER: Permene wears slowly and evenly, retaining its "flicking action" always. Therefore uniform contact with surface swept is maintained; there is less strain on equipment; and better sweeping performance is obtained.



MAKE YOUR OWN TEST: Try Modglin Permene on your own equipment and then you be the judge. *Write us on your letterhead and we will make arrangements through your local distributor.* We want you to see for yourself how uneconomical it has become to sweep with any fibre but Permene. *Write us for particulars today.*

Perma-**push**

The #1621 Perma-Push is the most efficient and long wearing push broom ever built for dust control. Its extremely durable Permene fibre is especially suited for sweeping asphalt, concrete, paving blocks, loose soil, sand, and other surfaces. Its rugged construction and [illegible] make it the ideal push broom for [illegible] and other [illegible] use. [illegible] will not [illegible] and [illegible] will not [illegible] [illegible] Perma-Push [illegible] [illegible] [illegible]

OBITUARY

Leon Schoonmaker, 68, former Long Island, N. Y., highway engineer, died at Forest Hills, N. Y., May 30. A year after his graduation from Princeton University in 1904, he became associated with the work of planning and developing the Long Island highway system. He continued to work for the Borough of Queens until his retirement in 1943. He planned the Horace Harding Boulevard. In the first world war he saw 15 months' service in France as a major in the engineering division for the Allied Expeditionary Force. He was a champion in tennis and golf.

Yacoub Zadigian, 70, civil engineer, died at New Milford, N. J., May 20. Before coming to this country he had served 35 years with Dukes.

Arthur E. Clark, 63, a civil engineer and manager of the Water & Sewage Works Manufacturers Association, New York, died at Morristown, N. J., May 24.

Raymond A. Jones, executive vice-president of the J. A. Jones Construction Co., Charlotte, N. C., died May 8 in Bolivia, where he was on an inspection tour for his company.

Matthew J. Cummings, 58, president of the Matthew Cummings Co., New England construction firm, died May 29 in Dorchester, Mass. He worked for the Boston Park Department for a number of years until his father, the late Matthew Cummings, founded the construction firm. He assumed control of the business at his father's death in 1938.

A. Clinton Decker, 63, civil engineer, died in Birmingham, Ala., May 22. He received a civil engineering degree from Cornell University. For a number of years he was a contract engineer for the Tennessee Coal, Iron & Railroad Co.

John B. Cabell, 74, a civil engineer with J. S. Sutton Corp. at Greenville, S. C., was killed in an industrial fall at White Water Falls, S. C., May 25. He was a graduate of Virginia Military Academy. In 1900 he took a fellowship at the California School of Technology. After getting his master's degree in civil engineering he went on other assignments for Cooper & Ingersoll. He was chief engineer at Camp Stewart at Hinton, Neck and Sicily, the construction of which he

(Continued on page 78)

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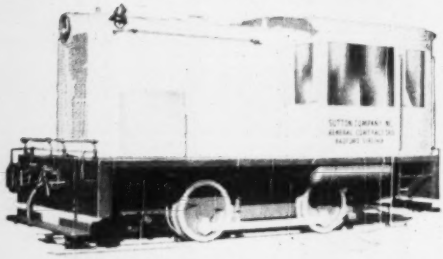

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supervised and for which he received the Army Commendation Ribbon.

Henning O. Christiani, 58, a civil engineer of Scarsdale, N. Y., was killed in an automobile accident in France May 25. He was a graduate of the Polytechnical University of Copenhagen, Denmark, and was connected with the Christiani and Nielsen Corp. of New York. He came here in 1920 and gained experience in engineering design on projects including the N. Y. City West Side Highway and New York World's Fair, and as consulting engineer to New Haven, Conn. In 1938 he entered the Copenhagen head office of Christiani and Nielsen. One month after the Nazi invasion of Denmark he returned to this country. He established a wartime central office in New York for the firm's branches in Allied countries, and extended the company's activities in South and Central America. During the war Mr. Christiani was a member of the U. S. Army Engineer Corps, and served on the staff at Fort Belvoir.

Frederick Duane Sheffield, 66, a bridge engineer in the King County engineering department, Seattle, Wash., died May 28 at Seattle. A graduate of Cornell, he had lived in Seattle for 35 years.

James Addison Jones, 80, founder and chairman of the board of the J. A. Jones Construction Co., Charlotte, N. C., died May 25. He maintained an active interest in the firm as chairman after relinquishing the office of president to his son, Edwin L. Jones. One of the principal builders of the Oak Ridge, Tenn., atomic project, the company erected shipyards at Panama City, Fla., and at Brunswick, Ga., during the war, and in addition to many projects in this country, has been engaged in construction projects in Okinawa and in South America.

John M. Picton, 47, chief planning engineer of Kansas City, Mo., died in Washington, D. C., May 19.

Ray Dunlap, 65, a Missouri Highway Department employee since 1925, died May 24. Formerly he was city engineer at St. Joseph for 19 years, then worked for the Highway Department at Joplin and Jefferson City.

Frank Lee, 77, district engineer for the Canadian Pacific Railway at Vancouver, B. C., for 14 years, and who retired in 1941 after 38 years of service with the railroad, died at Nanaimo, B. C., May 21.

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FOR JOINTS OR CRACKS
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FOR EXTERIOR REPAIRS
(SIKA-KOTE, SIKA TRANSPARENTS) SIKA-KOTE, a protective and decorative coating in 9 colors and white, prevents moisture penetration on concrete and masonry structures. SIKA TRANSPARENTS render brick structures water-repellent and preserve their appearance.

FOR NON-LEAKING SURFACES
(SIKACRETE, SIKA-KOTE) Water-resistant SIKACRETE mortar is used wherever cement-coat work is indicated. Economical, easy to apply SIKA-KOTE prevents penetration of ground-moisture.

FOR GUNITING OR PRESSURE GROUTING
(SIGUNIT, SIKA No. 4, PLASTIMENT) For quick work against leaks or in tidal areas, SIGUNIT in mortar prevents washouts. SIKA No. 4 (GROUT-SIKA) accelerates set, increases cohesion of mortar and adhesion of grout to rock.

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UNIT PRICES BID BY CONTRACTORS

Bituminous concrete road, Wicomico Co., Maryland

A low bid of $659,707, Apr. 18, took the contract for 6.315 miles of bituminous concrete with macadam base course in Wicomico County, on U. S. Route 50, for the Maryland State Roads Commission. This was only 7.5% under the high of five bids, 4% under the next to low bid.

Alternate prices on slag and stone were 60 cents per ton apart on the low bid with the contract awarded on the slag alternate at $7.95.

Work started May 1 and must be completed in 200 working days. The job is midway between Salisbury and Mardella, 5 miles from a railhead.

Class 1 excavation includes all excavation within cross section of the improvement, surfacing area and intersections over 15 feet in width. Cl. 2 covers approach ends under 15 feet, drainage structures, culverts and headwalls. Cl. 3 ditches, channel changes.

The minimum cement content in Class P-1 concrete is 1.5 bbl per cu. yd. with net water content 5.5 gals. per bag of cement.

Wage rates prevailing are unskilled labor, $0.90-1.00; semi-skilled, $1.40-1.50; skilled, $1.75-1.90.

	Quan.	Unit Prices	
Items	Qty.	1	2
Clear & grub	L.S.	$13,500	$25,000
Excav., Cl. 1	cy.	57,500	.55
Cl. 2	cy.	2,500	1.00
Cl. 3	cy.	2,500	.60
Borrow	cy.	5,000	.75
Tamped fill	cy.	1,500	1.00
Trim exist. ditches	lin. ft.	4,000	.10
Remove exist. struct.	cy.	30	5.00
Crusher run agg.	cy.	1,500	5.00
Mac. base course	sy.	97,000	1.25
Bit. matl.	gal.	1,500	.20
Penet. mac. for cr.	sy.	200	.60
Stabilized shoulders	sy.	61,000	.90
Calcium chloride	lb.	11,000	.06
Prot. mac. surf.	sy.	500	1.00
Bit. matl. penet. mac.	gal.	215,000	1.25
Bit. conc. spec.			
B-1, 4" slope	t.	165	9.00
B-1, 6" slope	t.	1,000	9.00
B-2, 4" slope	t.	250	9.00
B-2, 6" slope	t.	1,500	9.00
B-3, 4" slope	t.	200	9.00
B-3, 6" slope	t.	1,200	9.00
B-2, 4" slope	t.	1,000	9.00
B-2, 6" slope	t.	9,000	9.00
B-2, 8" slope	t.	3,000	9.00
Reinforcing steel	lb.	1,000	1.00
Corrugated pipe culv.	lf.	500	2.00
Reinf. conc. pipe culv.	lf.	500	2.00
12" RCP	lf.	1,000	4.00
15" RCP	lf.	1,000	4.00
24" RCP	lf.	1,000	4.00
30" RCP	lf.	1,000	4.00
36" RCP	lf.	150	4.00
42" RCP	lf.	150	4.00
48" RCP	lf.	150	4.00
Misc.			
Conc. spec. (1)	cy.	90	5.00
Conc. spec. (2)	cy.	100	5.00
Conc. spec. (3)	cy.	25	5.00
Conc. spec. (4)	cy.	25	5.00
Remove pipe culv.	lf.	500	1.00
Reload pipe culv.	lf.	500	1.00
Guard rail	lf.	1,000	2.00
Reinf. steel for	lb.	2,000	1.00
6" perf. pipe underd.	lf.	1,000	1.00
8" perf. pipe underd.	lf.	250	1.00
Adj. inlets	ea.	2	50.00
Adj. manholes	ea.	2	50.00
Guard rail, Cl. II	lf.	200	5.00
End sections	ea.	14	50.00
Concrete slope pav.	sy.	1,000	10.00
Traffic lights	ea.	1	10,000
Concrete flume	sy.	50	5.00
Flume flow line	lf.	50	1.00
Topsoil, stockpiled	cy.	1,000	.50
Topsoil, spread	sy.	50,000	.10
Seed & mulch	sy.	50,000	.10
Solid sod	sy.	500	1.00
Erosion flow mulch	sy.	200	1.50

1. C. F. Edgar Russell, Frederick, Md.	
Contract	$628,295.15
2. Nello L. Teer Co., Durham, N. C.	660,130.15
3. Bero Eng. & Constr. Corp., Hampton, Va.	711,226.75

Refuse incinerator for Waterbury, Conn.

Second low of five bidders, E. H. McGraw & Co., Inc., Hartford, Conn., was awarded the contract for a 300 ton capacity, pit and crane refuse incinerator in Waterbury, Conn., at $386,607.27. This is a unit cost of $1,289 per ton. W. J. Megin, Inc., Naugatuck, Conn., low bidder at $383,784.83, bid informally and his bid was not accepted. Malcolm Pirnie Engineers, New York, are consultants.

Work on the incinerator was started April 17 and must be completed in 270 days. The site is near the highway and two miles from a railhead. Wage rates prevailing are: carpenters, $2.121 per hr.; reinforcing steel workers, $2.50; electricians, $2.25; laborers, $1.55.

The contractors could bid on A, a circular, mechanically stoked furnace or B, a rectangular, hand-stoked furnace and alternates on the chimney, bridge crane and incinerator. The three lowest bidders submitted bids for both plans. The contract was awarded on Type A with "Kellogg" chimney, "Shaw Box" bridge crane and "Nichols" incinerator.

1. W. J. Megin, Inc., Naugatuck, Conn.	$383,784.83
2. E. H. McGraw & Co., Inc., Hart. (Low Contractor)	386,607.27
3. DeFrees Const. Co., Inc., Bridgeport	422,329.00
4. Foley Mechanic Corp., Brooklyn, Mass.	426,500.00
5. Waterbury Const. Co., Inc., Waterbury, Conn.	430,265.00

Type A Circ., mech-stoked furnace

	Quan.	Unit Prices	
Items	Qty.	1	2
Earth excav.	cy.	1,200	$2.50
Fill from borrow	cy.	500	2.50
Rock excav.	cy.	500	11.00
Struct. steel	t.	77	291.00
Demolish. etc.	ls.	1	165,258.43
Chimney			
Concrete	lf.		19.345
Kellogg	lf.		21.994
American	lf.		20.500
Bridge crane			
Shepard Niles	lf.		
Shaw Box	lf.		25.250
Harnischfeger	lf.		26.679
Incinerator (1)			
Nichols	lb.	1	120,000
Morse-Boulger	lb.	1	120,000
Ash handling equip.	lf.		21,934
Electric work	lf.		13,165
Add'l concr.	cy.	50	18.00
Add'l reinf. steel	lbs.	1,000	0.10

Type B Rect., hand-stoked furnace

	Quan.	Unit Prices	
Items	Qty.	1	2
Earth excav.	cy.	1,500	$2.00
Fill from borrow	cy.	900	2.00
Rock excav.	cy.	600	11.00
Struct. steel	t.	92	294.00
Demolish. etc.	ls.	1	165,223.43
Chimney			
Concrete	lf.		19.345
Kellogg	lf.		21.994
American	lf.		21.997
Bridge Crane			
Shepard Niles	lf.		
Shaw Box	lf.		25.269
Harnischfeger	lf.		29.869
Incinerator (1)			
Nichols	lb.	1	139,359
Morse-Boulger	lb.	1	120,000
Ash handling equip.	lf.		22.839
Electric work	lf.		13.572
Add'l concr.	cy.	50	18.00
Add'l reinf. steel	lbs.	1,000	0.10

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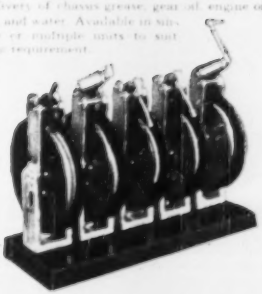

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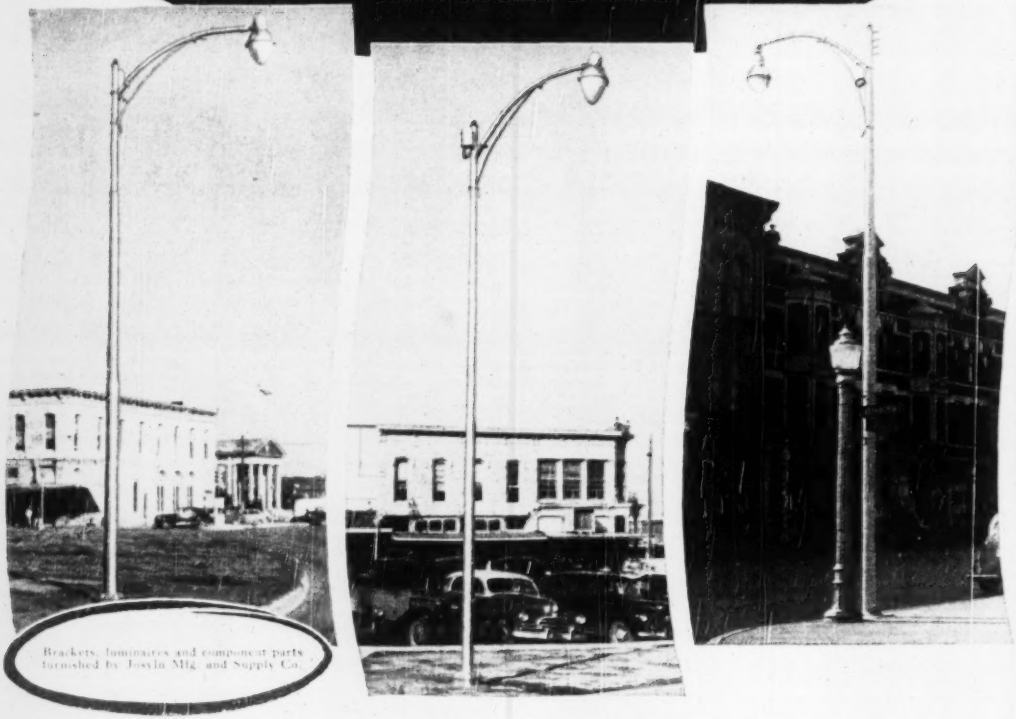

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UNITED STATES STEEL

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.
ELSIE EAVES, Manager J. A. MAHONEY, Reports M. R. ROESSLER, Statistics

WATER SUPPLY

BIDS ASKED

Ont., Port Hope, B.A. [illegible]

La., Grand Junction, B.A. [illegible]

Mo., St. Louis, B.A. [illegible]

Ont., Toronto, B.A. [illegible]

† D. C., Wash., B.A. [illegible]

† Md., Annapolis, B.A. [illegible]

Pa., Hummels Wharf, B.A. [illegible]

Tex., Brownsville, B.A. [illegible]

Minn., East Grand Forks, B.A. [illegible]

Tex., Houston, B.A. [illegible]

Tex., Houston, B.A. [illegible]

Tex., San Antonio, B.A. [illegible]

LOW BIDDERS

N. H., Hooksett, Town, Water Dept., Pump Sta. & Mains, B.A. [illegible]

CONTRACTS AWARDED

Mass., Franklin, Town, Water Dept., Mains, B.A. [illegible]

N. Y., Niagara Falls, B.A. [illegible]

Tex., Houston, B.A. [illegible]

SEWERS, WASTE DISPOSAL

BIDS ASKED

Mich., Detroit, B.A. [illegible]

▲ Mass., Brookline, B.A. [illegible]

N. J., Haddonfield, B.A. [illegible]

Calif., Eureka, B.A. [illegible]

Conn., Middletown, B.A. [illegible]

LOW BIDDERS

Ont., Toronto, B.A. [illegible]

Conn., Middletown, B.A. [illegible]

Mass., Braintree, B.A. [illegible]

CONTRACTS AWARDED

Calif., Long Beach, B.A. [illegible]

Mass., North Attleboro, B.A. [illegible]

Tex., Houston, B.A. [illegible]

BRIDGES

BIDS ASKED

+ Massachusetts, B.A. [illegible]

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada. Minimum sizes of larger water supply, sewerage, waterways $20,000; other public works $10,000; industrial buildings $68,

Classes of Construction

(Name in order of listing)

Bridges, Tunnels, Viaducts
Sewers, Waste Disposal
Streets & Roads
Earthwork, Waterways

Industrial Buildings
Commercial Buildings
Public Buildings
Unclassified

Stages Reported

PROPOSED (Usually including appointment of engineers or architects)

BIDS ASKED (new construction only) For full details see issue indicated in last NR

LOW BIDDERS (on all projects estimated at $100,000 value all low bidders listed, also on lesser projects published in the previous issue) Where award is not made to the low bidder, reasons for such action, if known, are given. Where award is split among several bidders, usually to low bid on each unit, the fact is noted.

CONTRACTS AWARDED (usually in the next issue in which last previous report was published)

Symbols and Abbreviations Include:

\+ Revised or added
▲ Project, $1,000,000 or over
B.A. Bids Asked
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

BRIDGES

LOW BIDDERS

Ky., Frankfort, May 26, [illegible] $108,125

[illegible] $53,799 [illegible] $63,686

[illegible] $122,687 [illegible] $140,460

▲ New Jersey, New Jersey Turnpike Auth., Art Projects, Middlesex & Monmouth Counties, Work on Structures & Approaches, Bridges, Pass. Overs & Under Passes, Toll Houses, Service Areas, Etc., Between New York, N. Y. & Camden, $1,161,069

New York, [illegible] $163,296

[illegible] $146,770 [illegible] $151,000

$63,405

Tex., Corpus Christi, [illegible] $51,225

CONTRACTS AWARDED

Ind., Richmond, Dec. 9, Wash. Twp. Sch. Bldg. Corp., Sch. Bldg., Wayne Co. Bldg. & Loan Bldg., $1,144,000 [illegible] $999,060

▲ New Jersey, New Jersey Turnpike Auth., Art Projects, Middlesex & Monmouth Counties, Work on Structures & Approaches, Bridges, Pass. Overs & Under Passes, Toll Houses, Service Areas, Etc., Between New York, N. Y. & Camden, $963,765

▲ New York, [illegible] $7,805,290

Virginia, [illegible] $561,629

STREETS AND ROADS

BIDS ASKED

LOW BIDDERS

CONTRACTS AWARDED

EARTHWORK, WATERWAYS

BIDS ASKED

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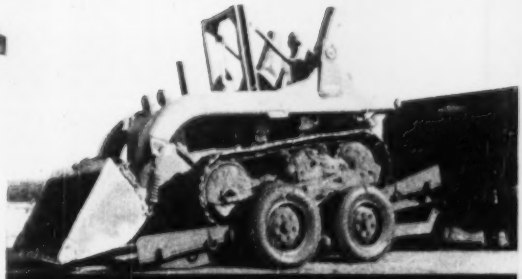

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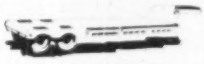

Tandem Axle Trailers

Single Axle Tilt Trailers

Single Axle Trailers

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General Electric 2-way radio reduces job time, cuts your costs—plenty. It works best where work crews are dispersed and distance is a problem: in cars of superintendents and section foremen, at field offices, supply points, and on mobile equipment operating over wide areas.

Whatever you build—highways, bridges, pipe lines, dams, tunnels, sewage works—if construction involves ground distance and time, then you've got a problem in communication. Why not turn this problem over to us . . . *instant communication* is our business. There's a G-E office near you. Call there for full information. Meanwhile, write us for useful new bulletin X55-752 on 2-way radio. *General Electric Company, Section 2206-15, Electronics Park, Syracuse, New York*

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Use this Class "E" Clam Shell Bucket for handling crushed stone, gravel, sand and other bulk materials.

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24 HOURS A DAY!

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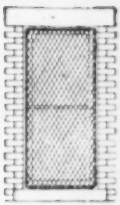
Notice the sturdy All-Beam framework . . . the extension arm and line post an integral unit. Stewart Non-Climbable Chain Link Wire Fence, the heaviest and strongest manufactured, features a number of exclusive structural advantages you can't afford to overlook. Write for folder "Here's why you should buy a Stewart Chain Link Wire Fence."



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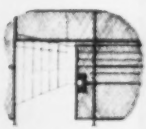
(Wire or Iron)

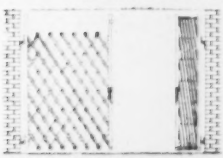
Made with round or channel frames to fit any size or shape opening. When requesting prices please give measurements and send diagrammatic sketch.

WIRE MESH PARTITIONS—Sectional

Fit any height or width. Easily and quickly erected. When writing for prices please give all measurements involved.



STEEL FOLDING GATES



Made in single or double gate construction to fit any width opening. Prices on request. Please give width and height of opening.

THE STEWART IRON WORKS CO., INC.
1767 Stewart Block Cincinnati 1, Ohio

Stewart IRON and WIRE FENCES

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BIDS ASKED

SOON LETS CONTRACT

LOW BIDDERS

CONTRACTS AWARDED

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LOW BIDDERS

CONTRACTS AWARDED

UNCLASSIFIED

BIDS ASKED

LOW BIDDERS

CONTRACTS AWARDED

PROPOSED PROJECTS

WATER SUPPLY

SEWERS, WASTE DISPOSAL

BRIDGES

STREETS AND ROADS

EARTHWORK, WATERWAYS

AIRPORTS

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PUBLIC BUILDINGS

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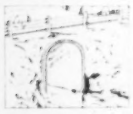
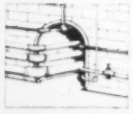
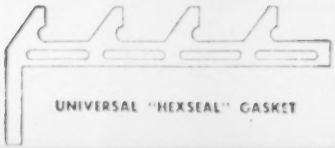
Flat-base pipe

FOR SAFETY, UTILITY, ECONOMY, SPEEDY CONSTRUCTION







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Universal plants in: Decatur & Dothan, Ala.; Tampa & Ocala, Fla.; Atlanta, Ga.; Kenvil, N. J.; Binghampton, Port Washington, Rochester & Syracuse, N. Y.; Columbus & Zanesville, O.; Norristown & Pittsburgh, Pa.; Nashville, Tenn.; Clarksburg & New Martinsville, W. Va.

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FINE WORKMANSHIP
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Just As You Wouldn't Use A Horse and Buggy

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You Wouldn't Use An Old Model Air Compressor

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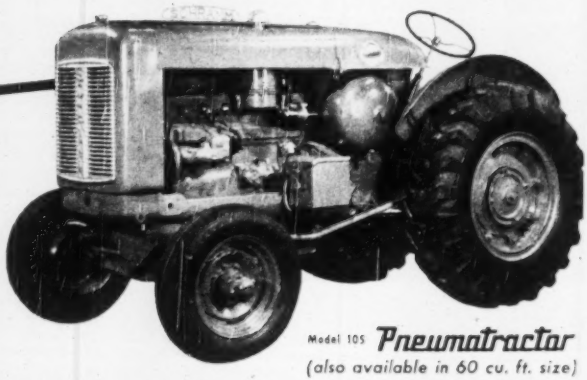
SCHRAMM

Pneumatractor



Model 105 ***Pneumatractor***
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The SCHRAMM *Pneumatractor* may very aptly be termed the "Newest of the New" —a self-propelled air compressor literally packed with far advanced features that put it in a class by itself. Its desirability over an old model air compressor can be likened to your preference for the modern automobile over the horse and buggy.

Here is why you should choose the SCHRAMM *Pneumatractor*. It can be easily transported . . . is strong, rugged, husky . . . and costs less than a separate tractor and separate compressor. Moreover, it is so flexible you can use it for an endless variety of compressed air jobs!

Going hand-and-hand with the *Pneumatractor* is the complete line of SCHRAMM auxiliary equipment also available . . . approved equipment which will enable you to do your job better.

Write today for Bulletin NEU-508 describing this most modern of air compressors and auxiliary equipment. In today's compressed air needs, you will find the *Pneumatractor* a "must".

SCHRAMM INC.

The Compressor People

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CONSTRUCTION REPORTS-Second Section

WATER SUPPLY

SEWERS, WASTE DISPOSAL

BRIDGES

STREETS AND ROADS

EARTHWORK, WATERWAYS

AMERICANS ABROAD

LATIN AMERICA

PUBLIC BUILDINGS

COMMERCIAL BUILDINGS

BIDS ASKED

▲ Ill. Chicago—APARTMENT—B.A. & 2d—Owner: Frank B. Frederick, prop., 22 S. N. Michigan Ave., Zone 1; 12 story 184 unit apartment. $1,750,000

La. Shreveport—[illegible]ATIONAL—B.A. & 2d—Hospital [illegible] Highland Ave. and Tulane St.; 2 story [illegible] educational bldg. Plans deposit $[illegible]; Perkins & Wheatley; Continental American Bank Bldg.

Alta. Lethbridge—HOSPITAL—B.A. & 2d—Zone. Hospital [illegible] Lethbridge General Hospital; 3d and 4th Floors; [illegible] Plans deposit $25; Meech, Meech & Meech, Medicine Hat.

Calif. Los Angeles—CLINIC, etc.—B.A. & 2d—Owner: City of Southern California, 2nd University Ave., [illegible] clinic and [illegible] $100 deposit; Stanton & Johnston, 237 [illegible] Bldg.; Architect & Engineer Bldg.; Reynolds & Johnson, 501 S. Boylston St., Room [illegible]

Wash. Pullman—HOSPITAL—B.A. & 2d—College Hospital, Stadium & Wall St., [illegible] Memorial hospital [illegible] $150,000. Plans deposit $35. Floyd Mundorf & Hudson, 2 Wall St., [illegible] architects.

Fla. Winter Haven—CHURCH—B.A. & 2d—First Methodist Church; Cox, Burke & McMurry, Wilby W. Church Ave., Knoxville, Tenn.; 2 story 50x120 ft.

▲ Wash. Aberdeen—HOSPITAL—B.A. & 2d—Owner: Joseph Hospital, Aberdeen; 3 story and basement 44x183 ft. [illegible] hospital. $1,000,000
Plans deposit $5. J. W. Maloney, Central Bldg., Seattle. Zone 4; [illegible] prof. CD 2 & 3.

Ill. Chicago—APARTMENT—Bids Asked—Owner: [illegible] Homeowners & Homeowners, owner, 131 W. Monroe St., Zone 3; 2 story apartment, 7317 N. Ridge Ave., Zone 26. $300,000

SOON LETS CONTRACT

▲ Ill. Evanston—[illegible]—Owner: [illegible] & Co., 2 [illegible] Bldg., Chicago; 2 story [illegible] Zone 1; [illegible] Chicago Architects CD

▲ Neb. Omaha—[illegible]—Owner: Northern Natural Gas Co., [illegible] Bldg.; 2 story [illegible] garage, 21 unit Bridge Apartments, [illegible] Architects & Engineers, 1307 Farnam St., Omaha.

LOW BIDDERS

▲ Tenn. Kingsport—HOSPITAL—Holston Valley Hospital, Inc., Kingsport; Lawrence McGlothlin, Jackson Bldg., Little Rock, Ark. $1,789,987

CONTRACTS AWARDED

▲ Calif. Manhattan Beach—DWELLINGS—Liberty Homes, Inc., 9465 Wilshire Blvd., Beverly Hills, Los Angeles; 51 [illegible] $1,163,000

▲ Calif. Sacramento—RESIDENCES—Joe Strazer, Town & Country Village, Sacramento; 150 residences in Santa Anita No. 2 Tract, $900,000; 90 residences in Del Paso Park View Tract, $540,000; near here.

▲ Calif. Sacramento—RESIDENCES—Joe Strazer, Town & Country Village, Sacramento; 141 stucco dwellings, Western Ave., Los Angeles; approx. $978,200. Kemmerer, Engr. and Contractor, Bldg.

▲ N. Y. Port Washington—HOUSING—North Hempstead Housing Auth., Valley School, High St., Manhasset, May 24; general contract; (1) 96 unit, 6 building housing Site A, Manhasset; (2) 66 unit, 6 building housing Sandy Hollow Site B, Port Washington; Arrington & Egan Corp., 161 Remsen St., Brooklyn, Zone 2; (1) $845,320; (2) and (2) $1,417,500, from Liss & Pilletta, 104-16 Roosevelt Ave., Corona; (2) $569,970. CD 5/9.

▲ S. C. Greenville—HOSPITAL—Greenville Memorial Hospital, Greenville, June 1; hospital addition, alterations, from Thompson & Street Co., 139 Lindsley Dr., S.E., Atlanta, Ga. $2,755,800. CD 5/2.

CONTRACTS AWARDED

▲ Calif. Modesto—SCHOOL—Bd. Educ., 14 and 1 Sts., 1 story, reinforcement, 48 classroom, Thos. Downey High School; Frank A. Payne & Son, 5 Overhill Rd., Orinda. $1,011,950. Bids 5/22. CD 5/31, under CB.

▲ Calif. San Francisco—INSTITUTE—Dir. P. Wise, City Hall; Jos. Dist. John A. O'Connell Vocational Technical School, 1 story, Hayes & Ingerson, 2100 Lake St., $1,062,742. Bids 5/17. CD 5/23, under CB.

▲ N. Y. Syracuse—HOUSING—Syracuse Housing Auth., 100 Washington St., general contract, Syracuse Housing Proj. NYS 44, bounded by [illegible] St., Fiske Ave., Beacon Rd., Hazelhurst Ave., New St. and Tait Ave., to E. D. Rudd Co., Inc., 101 Park Ave., New York, Zone 17. $1,286,430. Bids 4/17. CD 4/7.

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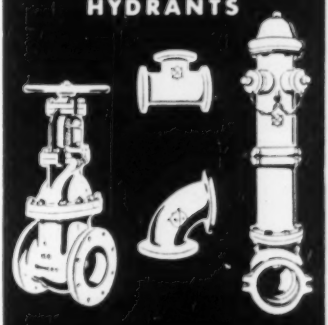

THE KENNEDY VALVE MFG. CO.
1066 EAST WATER ST.
ELMIRA, NEW YORK

OFFICIAL PROPOSALS

Bids June 22, 1950 (8321)

George Washington Bridge

THE PORT OF NEW YORK AUTHORITY
TO CONSTRUCT FROM GEORGE WASHINGTON BRIDGE TO HENRY HUDSON PARKWAY, STAGE I
BRIDGES
CONTRACT GWB-13

Sealed proposals for making borings for the Connection from the George Washington Bridge to the Henry Hudson Parkway, Stage I, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1109, 111 8th Ave., New York, N. Y., until 11:30 A.M., Standard Time, June 22, 1950, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer, and copies will be furnished upon deposit of $20 per set. The deposit will be refunded if the documents are returned in good condition, not later than 20 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, June 15, 1950

Bids: June 29, 1950 (8215)

New Jersey Turnpike Authority

* * *

Sealed Proposals will be received by the New Jersey Turnpike Authority, for the following contract:

CONTRACT NO. 71

The work to be performed under this Contract involves the construction of Part A, the construction of bridges and the enlargement of roadbed and Part B, demolition of buildings, garages and sheds, furnishing, placing and compacting granular graded borrow excavation materials, reestablishment, relocation of sewers and water mains, construction of storm drain systems, paving of widened roadways, and other incidental work in connection with the construction of the New Jersey Turnpike from Third Avenue to Port Avenue in the City of Elizabeth, Union County, New Jersey.

Principal items of work include:

BRIDGE ITEMS—PART A

Open Foundation Excavation
15,200 Cu. Yds.
Furnishing and Driving Steel
Bearing Piles 37,000 Lin. Ft.
Cast-in-Place Concrete Bearing Piles
Concrete in Pile Caps, Footings, Bent, Abutments, Wing Walls and Parapets 9,600 Cu. Yds.
Reinforcement Steel 1,750,000 Lbs.
Structural Steel (Various Sizes) 4,500 Lbs. Ft.

GRADING AND PAVING ITEMS—PART B

Roadway Excavation, Earth 2,000 Cu. Yd.
Borrow Excavation 250,000 Cu. Yd.
Topsoiling 30,000 Sq. Yd.
Storm Drains and Sewers (Various Sizes) 37,000 Lin. Ft.
Water Mains (Various Sizes) 1,500 Lin. Ft.
Manholes 35 Each
Inlets 31 Each
Concrete Cribbing 3,500 Cu. Yd.
Demolition of Buildings 12 and Sundry Buildings

Proposals will be received at Authority of the New Jersey Turnpike Authority, 67 Prospect Street, Trenton 8, New Jersey, until 10:30 o'clock DST on the morning of June 28, 1950, and thereafter in the Veterans' Room of the War Memorial Building, Memorial Drive at Willow Street, Trenton, New Jersey, until 11:00 A.M. DST on the same date at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen and may be inspected by prospective bidders during office hours, after June 12, 1950, at the office of the New Jersey Turnpike Authority, 67 Prospect Street, Trenton, New Jersey, and at the office of the Engineers, Parsons, Brinckerhoff, Hall & Macdonald, 51 Broadway, New York 6, New York.

Contract documents will be furnished for $7.00 for each set, upon application to the Authority. The payment will not be refunded, and Contract Documents are not required to be returned.

* * *

CONTRACT NO. 58

The work to be performed under this Contract includes clearing and Topsoiling and necessary incidental work in connection with construction of the New Jersey Turnpike, Section 5, between Sta. 845 and Sta. 874, north of the Raritan River, in the City of Linden. Completion date is October 31, 1951.

Principal items of work include:

Roadway Excavation, Muck
250,500 Cubic Yards
Borrow Excavation and Embankment
260,500 Cubic Yards
Channel Excavation 2,500 Cubic Yards
Topsoiling (Areas) 42,500 Square Yards

Proposals will be received at the office of the New Jersey Turnpike Authority, 67 Prospect Street, Trenton, New Jersey, until 10:30 o'clock DST on the morning of June 28, 1950, and thereafter in the Veterans' Room of the War Memorial Building, Memorial Drive at Willow Street, Trenton, New Jersey, until 11:00 A.M. DST on the same date, at which latter time and place said proposals will be publicly opened and read. Eastern Daylight Time applies.

Contract documents may be seen, and may be inspected by prospective bidders during office hours, after June 12, 1950, at the office of the New Jersey Turnpike Authority, 67 Prospect Street, Trenton, New Jersey, and at the office of the Engineers, Howard, Needles, Tammen & Bergendoff, 1 Beacon Street, Boston, Massachusetts, and 25 Livingston Avenue, New Brunswick, New Jersey.

Contract documents will be furnished for $10.00 for each such application to the Authority. The payment will not be refunded and Contract Documents are not required to be returned.

* * *

The receipt and opening of proposals is subject to proper prequalification of the bidder in accordance with the regulations adopted by the New Jersey Turnpike Authority. Bidders must also submit with their proposal a revised financial statement and a statement of plant and equipment.

Proposals must be made upon the standard proposal forms in the manner designated in the Standard Specifications for Construction of New Jersey Turnpike and must be enclosed in the sealed special addressed envelope bearing the name and address of the bidder and the number of the Contract on the outside, and must be accompanied by a certified check drawn to the order of the New Jersey Turnpike Authority, and a proposal bond, each for not less than 5% of the amount of the proposal, but for not more than $200,000 nor more than $250,000 and must be delivered with proposal on or before the hour named. Copies of the proposal form to be used for submitting proposals of the form for proposal bond of the form to be used for financial statement and plan and experience statement to be submitted with proposal and special addressed envelope are furnished to detached form with the contract documents.

Contracts will be awarded or proposals rejected within fifteen (15) days from the date of opening proposals. The right is reserved to reject any or all proposals.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast
Chairman

June 9, 1950

Bids Close June 29, 1950 (8311)

Construction of Bridge

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for

BRIDGES, PALISADES INTERSTATE PARKWAY

Construction of four bridges on Palisades Interstate Parkway Sections 1A and 2D, in the Borough of Tenafly, Bergen County. The principal items of construction are:

Estimated
3,500 Sq. Ft. Rough Stone Masonry
190 Cubic Yards Concrete Masonry
2,285 Cu. Yds. Concrete in Structures
146,200 lbs. Reinforcement Steel in Structures

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, New Jersey, on Tuesday, the 15th day of September, 1950, at 11:00 A.M. EASTERN STANDARD TIME, eleven o'clock (11) to A.M. DAYLIGHT SAVING TIME, and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper prequalification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment on the form provided.

Drawings, specifications and form of the contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J. and may be inspected by prospective bidders during office hours. Drawings may be obtained upon deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102 State House Annex, Trenton, N. J. Bids must be made upon the standard proposal forms and the work designated in the standard State Highway specifications and must be inclosed in sealed special addressed envelopes bearing the name and address of the bidder and work to be done on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid provided that the said certified check shall not be less than $500.00 nor more than $2,000.00 and must be delivered at the above place of opening of bids at hour named. Copies of the standard proposal forms and special addressed envelope will be furnished on application. Bids not inclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

(Continued on page 97)

OFFICIAL PROPOSALS
(Continued from page 96)

Superstructure

Route Construction

OFFICIAL PROPOSALS

Sewage Disposal System and Sewer Improvements

Road Construction

OFFICIAL PROPOSALS

Sewer Construction

OFFICIAL PROPOSALS
(Continued from page 97)

Bids: June 26, 1950 (814)

Parkway Grading

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for

PALISADES INTERSTATE PARKWAY, SECTIONS 2D & 1B

Grading of Palisades Interstate Parkway, New Jersey, Sections 2D & 1B, from Station 166+00 to Station 214+00, North of Clinton Avenue, Boroughs of Englewood Cliffs and Tenafly, Bergen County. Length 4.931± miles.

Estimated
16,700 cu. yds. Roadway Excavation—Earth
32,700 cu. yds. Roadway Excavation—Rock
2,900 cu. yds. Wet Excavation
50,000 cu. yds. Borrow Excavation

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, New Jersey, on Monday, June 26, 1950, at ten minutes (10:00 A.M. (EASTERN STANDARD TIME), eleven o'clock (11:00 A.M. DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made upon the standard proposal forms furnished by the State Highway Department, and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten per cent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

Bids: June 26, 1950 (815)

Route Construction

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for

ROUTE 25 EXT., SECTION 2-A
Construction of Route 25 Extension, Section 2A, from Pennsylvania Railroad (Belvidere & Delaware Branch) to Main Jetty Street, Cape County, Grading and Drainage, City of Trenton, Mercer County. Federal Project No. FI-1001(4). Length 1.240 miles.

Alternative "A" Pipe Arch Culvert
Estimated
Roadway
76,500 cu. yds. Roadway Excavation—Earth
12,000 cu. yds. Wet Excavation
22,500 cu. yds. Borrow Excavation
Structures
250 lin. ft. Type "B" Concrete Box Culvert
217,250 lb. Reinforcement Steel in Structures
Alternative
Roadway
76,500 cu. yds. Roadway Excavation—Earth
12,000 cu. yds. Wet Excavation
22,500 cu. yds. Borrow Excavation
Structures
250 lin. ft. Type "B" Concrete Box Culvert
217,250 lb. Reinforcement Steel in Structures
Alternative "B" Concrete Box Culvert
Roadway
76,500 cu. yds. Roadway Excavation—Earth
12,000 cu. yds. Wet Excavation
22,500 cu. yds. Borrow Excavation
Structures
250 lin. ft. Type "B" Concrete Box Culvert
217,250 lb. Reinforcement Steel in Structures
Bridges
24,000 sq. ft. Type MA Bridge Paving
Guiderail
Roadway Wall Reinforcement
Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, New Jersey, on Monday, June 26, 1950, at ten minutes (10:00 A.M. (EASTERN STANDARD TIME), eleven o'clock (11:00 A.M. DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 23 of the Revised Statutes of New Jersey, and supplements, and by Section 1, Public Laws 521, 80th Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as ratified. The minimum wage that will be required to be paid on this contract shall be $.75 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made upon the standard proposal forms furnished by the State Highway Department, and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten per cent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

Bids: June 26, 1950 (817)

Route Construction

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for

ROUTE 26 EXT., SECTION 2-A
Construction of Route 26 Extension, Section 2A, from Pennsylvania Railroad (Belvidere & Delaware Branch) to Main Jetty Street, Cape County, Grading and Drainage, City of Trenton, Mercer County. Federal Project No. FI-1001(4). Length 1.240 miles.

Alternative "A" Pipe Arch Culvert
Estimated
Roadway
76,500 cu. yds. Roadway Excavation—Earth
12,000 cu. yds. Wet Excavation
22,500 cu. yds. Borrow Excavation
Structures
250 lin. ft. Type "B" Concrete Box Culvert
217,250 lb. Reinforcement Steel in Structures
Alternative
Roadway
76,500 cu. yds. Roadway Excavation—Earth
12,000 cu. yds. Wet Excavation
22,500 cu. yds. Borrow Excavation
Structures
250 lin. ft. Type "B" Concrete Box Culvert
217,250 lb. Reinforcement Steel in Structures
Alternative "B" Concrete Box Culvert
Roadway
76,500 cu. yds. Roadway Excavation—Earth
12,000 cu. yds. Wet Excavation
22,500 cu. yds. Borrow Excavation
Structures
250 lin. ft. Type "B" Concrete Box Culvert
217,250 lb. Reinforcement Steel in Structures
Bridges
24,000 sq. ft. Type MA Bridge Paving
Guiderail
Roadway Wall Reinforcement
Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, New Jersey, on Monday, June 26, 1950, at ten minutes (10:00 A.M. (EASTERN STANDARD TIME), eleven o'clock (11:00 A.M. DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 23 of the Revised Statutes of New Jersey, and supplements, and by Section 1, Public Laws 521, 80th Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions may be obtained upon request from this office or from the State Employment Service, 8-12 North Willow Street, Trenton, N. J. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all persons hereafter employed on this contract shall be $.75 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made upon the standard proposal forms furnished by the State Highway Department, and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten per cent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

Bids: July 13, 1950 (793)

Senior High School and Recreational Facilities

TOWN OF EAST PROVIDENCE,
RHODE ISLAND

Sealed bids for the construction of the Junior High School, SENIOR HIGH SCHOOL AND RECREATIONAL AUDITORIUM FOR THE TOWN OF EAST PROVIDENCE, RHODE ISLAND will be received at the office of the Superintendent of Schools, 100 Grove Avenue, East Providence, Rhode Island, until 7:00 o'clock P.M. (EDST) on July 12, 1950 and will be publicly opened and read by the Chairman of the School Committee at 7:15 o'clock P.M. (EDST) in the Library of the proposed School. Taunton Avenue, East Providence, Rhode Island.

The project consists of a fireproof Each school building of approximately 20 rooms, an auditorium, cafeteria, gymnasium, swimming pool and the site development and about 20 acres for outside recreational and athletic facilities.

The contract documents, including plans and specifications may be examined on and after June 30, 1950 at the office of the Engineers, A. W. Maguire & Associates, 911 Turks Head Building, Providence, Rhode Island and copies may be obtained upon deposit of $100.00 for each set taken. The amount of the deposit will be refunded to each person who returns the plans and documents in good condition within fifteen days after the opening of bids, otherwise said deposit will be forfeited.

All proposals in the same [illegible] shall be submitted with each bid, subject to the conditions set forth in the Instruction to Bidders.

No bid may be withdrawn for a period of thirty (30) days subsequent to the opening of bids.

The School Committee of the Town of East Providence, Rhode Island reserves the right to waive any informalities or to reject any or all bids.

EAST PROVIDENCE SCHOOL COMMITTEE
Francis T. Regan, Chairman

(Continued on page 99)

OFFICIAL PROPOSALS
(Continued from page 98)

Bids: June 14, 1950 (757)

Trunk Line Sewers

BETHLEHEM, PA.

Sealed proposals addressed to the Bethlehem Authority of the City of Bethlehem, Pa. for the construction of Trunk Line Sewer Sections 1, 2, 3, 4 and 5 will be received at the office of the Bethlehem Authority, 325 N. New St., Bethlehem, Pa., until 11:00 A.M. Eastern Standard Time, on the 14th day of June 1950 at which time and place they will be publicly opened and read.

Plans and specifications, form of contract and bidding forms are on file and may be obtained at the office of the Bethlehem Authority, 325 N. New St., Bethlehem, Pa. by depositing $5.00 for each set, which amount will be refunded if bid is submitted and the plans are returned in good condition. In case no bid is submitted, $3.00 will be refunded if said plans and specifications are returned in good condition within two weeks of the date set for the receiving of bids by the Authority.

No bidder will be permitted to withdraw his bid for a period of thirty (30) days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to award a contract for each of the sections for which proposals are invited, to reject any or all proposals or to accept any bid deemed advisable to the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a certified check, Bank Treasurer's check or Cashier's check for an amount equal to ten (10) per cent of the total of the bid submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish before the faithful performance of the work under the contract, Performance Bond and Labor and Materialmen's Bond, each in the penal sum of fifty (50) per cent of the total of the bid submitted.

Approximate quantities:

[illegible]

Date: June 21, 1950 (774)

Alterations & Additions to Schools

THE BOARD OF EDUCATION OF [illegible]

Sealed bids for the general contract, Plumbing and Ventilating Work, Electric Wiring and Electrical Work for the Alterations and Additions to the New [illegible] School, Narrowsburg, New York, will be received by the Board of Education in the School Building, Narrowsburg, New York, until 8:00 P.M. (D.S.T.) on Friday, June 23, 1950, at which time and place they will be publicly opened and read.

Plans and specifications may be obtained from the Architect, [illegible] Architect, [illegible] New York, upon deposit of $25.00 for each set. Checks should be made payable to the Architect. Deposits will be refunded to bidders who submit bids and return plans and specifications in good condition within ten days after the opening of bids.

Bidders must be prepared to furnish Performance Bond in the amount of 100% of the contract price and Labor and Materialmen's Bond in the amount of 50% of the contract price.

Bids must be made on the forms provided by the Architect and must be accompanied by a certified check, bank draft or cash in the amount of 5% of the bid price.

The Board of Education reserves the right to reject any or all bids.

Bids must be delivered at the above place and before the hour named. Copies of the required forms and specifications may be obtained on application to the Architect.

[illegible]

Robert L. Fox
Executive Director

Date: June 21, 1950 (775)

Road Construction

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department at the office of the Commissioner of Highways, State House Annex, Trenton, New Jersey, until 10:00 A.M. Eastern Daylight Saving Time on the 27th day of June, 1950, for the improvement by construction of the following described section of highway:

[illegible]

Plans, proposal forms and specifications may be examined at the office of the Commissioner of Highways, State House Annex, Trenton, New Jersey, and at the office of the District Engineer, [illegible] New Jersey.

Copies of the plans, proposal forms and specifications may be obtained upon application to the Commissioner of Highways, State House Annex, Trenton, New Jersey, accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey in the amount of the bid proposed for the work, or by a bid bond executed by the bidder and a surety company authorized to do business in the State of New Jersey, in the amount of the bid proposed for the work, which check or bid bond will be returned to the bidder upon the delivery of the bid proposal properly executed and with all the required papers attached thereto, at the office of the Commissioner of Highways, State House Annex, Trenton, New Jersey, or at the office of the District Engineer, [illegible] New Jersey, before the hour named. Copies of the required forms and specifications will be furnished on application to the Commissioner of Highways, State House Annex, Trenton, New Jersey, or to the District Engineer, [illegible] New Jersey.

Bidders will be required to comply with the provisions of the Act of Congress, approved June 13, 1934, entitled "An Act to prevent discrimination on account of race or color in the employment of laborers and mechanics employed on work paid for in whole or in part out of funds of the United States," and the regulations issued thereunder by the President of the United States.

Bidders will be required to comply with the provisions of the Act of Congress, approved June 25, 1936, entitled "An Act to regulate the hours of labor and employment on public contracts," and the regulations issued thereunder by the Secretary of Labor.

Bidders will be required to comply with the provisions of the Act of Congress, approved June 28, 1938, entitled "An Act to prevent pernicious political activities," and the regulations issued thereunder by the United States Civil Service Commission.

Bidders will be required to comply with the provisions of the Act of Congress, approved August 30, 1935

OFFICIAL PROPOSALS
(Continued from page 99)

Bids: June 21, 1950 (7341)
STATE DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONTRACTS & ACCOUNTS
ALBANY, NEW YORK

Sealed proposals will be received by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., until 10:00 o'clock A.M., Advanced Standard Time, on WEDNESDAY, JUNE 21, 1950, for projects in the following counties:

County	Deposit Required	Bid Deposit	Type	Miles	Estimated Engineers' Estimate
Albany	$10	$5,000	Asp. Conc. Tr. 1A Opt.	3.22	$ 4,000
Allegany	10	12,000	Asp. Conc. Tr. 1A Asp. Conc. Tr. 1A Widening M. Work & C. Slab Br. 27' x 32' Span	1.93	207,000
Bronx	100	285,000	9" Conc. Conc. Part 36 Wide Steel Plate Girder 1355 Ft. Girder Rf. Sp. & Alpha I. Beam Arch Ramps	0.36	5,214,000
			The project involves the use of Alpha Composite Construction which is patented and the royalty is $500.		
Cattaraugus	10	12,000	Asp. Conc. Tr. 1A Asp. Conc. Tr. 1A Widening M. Work & C. Slab Br. 27' x 32' Span	1.81	207,000
Chenango	10	2,000	Bit. Type Surface Resurf. Existing	4.64	35,000
Clinton	10	6,000	Asp. Conc. Tr. 1A Opt.	2.07	101,000
Erie	15	24,000	Asp. Conc. Tr. 1A Asp. Conc. Tr. 1A Opt. Br. Alpha Br.	0.74	419,196
			The project involves the use of Alpha Composite Construction which is patented and the royalty is $500.		
Herkimer	10	2,000	Asp. Conc. Tr. 1A	4.22	125,000
Lewis	10	3,000	Asp. Conc. Tr. 1A Opt.	5.00	156,000
Montgomery	15	36,000	Conc. Conc. Part 42 Wide Asp. Conc. Tr. 1A Opt. Br. Reg. Frame	4.80	663,000
New York	100	180,000	Br. Tr. Fac. Part Var. Width Br. Trans. Pal Underpass 4 R.C. Viaduct Sep. St. Str. R.C. Arch w/sp. to Earth Conc. Retaining Wall Reg. Frame	0.28	3,284,000
Niagara	15	24,000	Asp. Conc. Tr. 1A Opt. Asp. Tr. Opt. Br. Alpha Br.	0.74	419,107
			The project involves the use of Alpha Composite Construction which is patented and the royalty is $500.		
Onondaga	10	4,000	Asp. Conc. Tr. 1A Opt.	0.85	262,000
Ontario	15	17,000	Crushed Stone Surface Treated Widening M. Work	6.35	308,000
Suffolk	100	35,000	Grading & Struct. A.C.P. A.C.P. Overlay A.C.P. Resurfacing Conc. Br. Conc. Bridge Prestressed Conc. Bridge Reinforced Conc. Bridge Steel Bridge Reinforced Conc. Box Culvert	4.76	1,750,000
Sullivan	15	15,000	Bit. Mac. Surface Mill To Depth Widening M. Work & C. Slab Bridge Br.	0.35	268,000
Tioga	10	4,000	Asp. Conc. Tr. 1A Opt.	4.38	91,000
Warren	10	2,000	Landscaping	14.96	57,000
Wayne	10	10,000	Asp. Conc. Tr. 1A	3.08	173,000

Maps, plans, specifications and estimates may be obtained at the office of the Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineer in whose district the work is located. Specifications and addresses of the District Engineers will be furnished on request and may be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated. A refund will be made in full to bidders for return of one set, in good condition, within 20 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to Special Information for bidders in the proposal, specification and contract agreement, and to the special provisions applying to projects financed with federal funds.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft, or certified check payable to the Commissioner of Taxation & Finance of the State of New York, in the amount specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in Instructions to Bidders, in which optional types are permitted in contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

J. D. TALLAMY
Supt. of Public Works

Bids: June 26, 1950 (8190)

Route Grading

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 14, SECTION 15

Grading of Route 14, Section 15, from Berkley Road to Delaware Road, Borough of Paulsboro and Townships of Greenwich, Logan and Woolwich, Gloucester County, Federal Project No. F-122-(5). Length 2.773 miles.

Alternative Method "A"

Estimated
118,500 cu. yds. Roadway Excavation—Earth
367,500 cu. yds. Wet Excavation
124,000 cu. yds. Borrow Excavation

Alternative Method "B"

128,500 cu. yds. Roadway Excavation—Earth
162,500 cu. yds. Wet Excavation
1,086,500 cu. yds. Borrow Excavation
45,500 cu. yds. Sand Blanket
112,200 lin. ft. Vertical Sand Drains

(NOTE: Bidders may submit on either Alternative Method "A" or "B".)

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, N. J., on Monday, June 26, 1950, at ten o'clock (10:00) A.M., EASTERN STANDARD TIME, or eleven o'clock (11:00) A.M., DAYLIGHT SAVING TIME, and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a Federal Aid Project authorized by the provisions of Title 23 of the Revised Statutes of New Jersey and supplements and by Section 1, Public Laws 874, 80th Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads Department of Commerce, as outlined in the specifications, which provisions require that labor employed from lists furnished by the State Employment Service, 248 North Broad Street, Elizabeth, N. J. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $1.25 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans, upon application to A. Lee Grover, Chief Engineer, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work to be performed, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

Bids: June 28, 1950 (8201)

Route Grading

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 4 PARKWAY, SECTIONS 5A & 9A

Grading of Route 4 Parkway, Sections 5A & 9A from Route 24—North Avenue to Bodenort Avenue, Townships of Cranford and Union, Borough of Kenilworth, Union County, Federal Project No. [illegible]. Length 2.314 miles.

Estimated
126,000 cu. yds. Roadway Excavation—Earth
11,500 cu. yds. Wet Excavation
[illegible] cu. yds. Borrow Excavation
2,200 sq. yds. 4" Macadam Base Course
2,100 sq. yds. 2" Bit. Mac. Surface
2,500 sq. yds. 2" Mod. Bit. Mac. Intermediate Course
342 lin. ft. Pavement Type MA 1955
1,125 unit Trimming Existing Trees
300 units Shrubs & Bushy Clumps
Salvage

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, N. J., on Monday, June 26, 1950, at ten o'clock (10:00) A.M., EASTERN STANDARD TIME, or eleven o'clock (11:00) A.M., DAYLIGHT SAVING TIME, and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a Federal Aid Project authorized by the provisions of Title 23 of the Revised Statutes of New Jersey and supplements and by Section 1, Public Laws 874, 80th Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads Department of Commerce, as outlined in the specifications, which provisions require that labor employed from lists furnished by the State Employment Service, 248 North Broad Street, Elizabeth, N. J. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $1.25 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans, upon application to A. Lee Grover, Chief Engineer, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work to be performed, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

(Continued on page 101)

OFFICIAL PROPOSALS

(Continued from page 100)

Bids June 22, 1950 (7779)

Water Distribution & Sanitary Sewerage System & Plant

Sealed proposals will be received by the Hanover Water Supervising Authority, Municipal Building, Hanover, Pa., for Hanover Water Supply Project, Federal Water Pollution Control Act, Title III, Drought Relief Project, Docket No. 1, until 2 P.M. Eastern Daylight Saving Time, June 22, 1950, at which time and place the bids will be publicly opened and read aloud. Bid Documents, Drawings and Specifications for the Water Supply and Sanitary Sewerage System and Sewage Treatment Plant, Hanover, Pa., and other Specifications and other information may be obtained from Richard J. Heritage, Engineer, 322 North Third Street, Harrisburg, Pennsylvania. Each proposal must be accompanied by a certified check or bank cashier's check drawn to the order of the Hanover Water Supervising Authority, for an amount equal to 5 per cent of the total bid, as a guarantee that the bidder will enter into a contract with the Authority within ten days after the bid has been accepted, and will furnish a bond in the amount of 100 per cent of the contract price within ten days after the contract has been awarded. The Hanover Water Supervising Authority reserves the right to reject any or all bids, and to waive any informalities in the bidding.

Jack N. Messner, Secretary
Hanover Water Supervising Authority
Hanover, Pennsylvania

Bids: July 14, 1950 (7781)

Plumbing

BETHLEHEM, PA.

NOTICE TO BIDDERS

Contract No. 4

Sealed proposals addressed to the Bethlehem Authority at Room 12 of Bethlehem City Hall, Bethlehem, Pa., for Plumbing for Sewage Treatment Plant, will be received at the office of the Bethlehem Authority, 25 N. New St., Bethlehem, Pa., on or before 9:00 A.M., Eastern Daylight Saving Time, on the 14th day of July, 1950. At which time and place they will be publicly opened and read.

Each proposal must be accompanied by a certified check, bank cashier's check or bank treasurer's check, drawn to the order of the Bethlehem Authority, Bethlehem, Pa., for an amount equal to 5 per cent of the total amount of the bid submitted. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under the contract, an approved Surety Company Performance Bond in an amount equal to 50 per cent of the bid as security for the faithful performance of the contract, and a Labor and Materials Bond in an amount equal to 50 per cent of the bid as security for the payment of all persons performing labor and furnishing materials in connection with the contract. Bond to be executed by an approved Surety Company authorized to do business in the Commonwealth of Pennsylvania.

The Bethlehem Authority reserves the right to reject any or all bids, and to waive any informalities in the bidding.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. COYLE, CHAIRMAN
ROBERT L. FOX, Executive Director

OFFICIAL PROPOSALS

Bids: July 14, 1950 (7775)

Heating and Ventilating

BETHLEHEM, PA.

NOTICE TO BIDDERS

Contract No. 3

Sealed proposals addressed to the Bethlehem Authority at Room 12 of Bethlehem City Hall, Bethlehem, Pa., for Heating and Ventilating for Sewage Treatment Plant, will be received at the office of the Bethlehem Authority, 25 N. New St., Bethlehem, Pa., until 9:00 A.M., Eastern Standard Time, on the 14th day of July, 1950, at which time and place they will be publicly opened and read.

Each proposal must be accompanied by a certified check, bank cashier's check or bank treasurer's check, drawn to the order of the Bethlehem Authority, Bethlehem, Pa., for an amount equal to 5 per cent of the total amount of the bid submitted. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under the contract, an approved Surety Company Performance Bond in an amount equal to 50 per cent of the bid as security for the faithful performance of the contract, and a Labor and Materials Bond in an amount equal to 50 per cent of the bid as security for the payment of all persons performing labor and furnishing materials in connection with the contract. Bond to be executed by an approved Surety Company authorized to do business in the Commonwealth of Pennsylvania.

No bidder will be permitted to withdraw his bid within 30 days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to reject any or all proposals or to waive any informality in any bid received and to accept any bid deemed advantageous for the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a certified check, bank treasurer's check or cashier's check in an amount equal at least to 5 per cent of the total of the bids submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under the contract, an approved Surety Company Performance Bond in an amount equal to 50 per cent of the bid as security for the faithful performance of the contract, and a Labor and Materials Bond in an amount equal to 50 per cent of the bid as security for the payment of all persons performing labor and furnishing materials in connection with the contract.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. COYLE, CHAIRMAN
ROBERT L. FOX, Executive Director

Bids: July 14, 1950 (7776)

Electric Power, Control and Lighting System

BETHLEHEM, PA.

NOTICE TO BIDDERS

Contract No. 2

Sealed proposals addressed to the Bethlehem Authority at Room 12 of Bethlehem City Hall, Bethlehem, Pa., for Electric Power, Control and Lighting System for Sewage Treatment Plant, will be received at the office of the Bethlehem Authority, 25 N. New St., Bethlehem, Pa., until 9:00 A.M., Eastern Standard Time, on the 14th day of July, 1950, at which time and place they will be publicly opened and read.

Each proposal must be accompanied by a certified check, bank cashier's check or bank treasurer's check, drawn to the order of the Bethlehem Authority, Bethlehem, Pa., for an amount equal to 5 per cent of the total amount of the bid submitted. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under the contract, an approved Surety Company Performance Bond in an amount equal to 50 per cent of the bid as security for the faithful performance of the contract, and a Labor and Materials Bond in an amount equal to 50 per cent of the bid as security for the payment of all persons performing labor and furnishing materials in connection with the contract. Bond to be executed by an approved Surety Company authorized to do business in the Commonwealth of Pennsylvania.

No bidder will be permitted to withdraw his bid within 30 days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to reject any or all proposals or to waive any informality in any bid received and to accept any bid deemed advantageous for the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a certified check, bank treasurer's check or cashier's check in an amount equal at least to 5 per cent of the total of the bids submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under the contract, an approved Surety Company Performance Bond in an amount equal to 50 per cent of the bid as security for the faithful performance of the contract, and a Labor and Materials Bond in an amount equal to 50 per cent of the bid as security for the payment of all persons performing labor and furnishing materials in connection with the contract. Bond to be executed by an approved Surety Company authorized to do business in the Commonwealth of Pennsylvania.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. COYLE, CHAIRMAN
ROBERT L. FOX, Executive Director

OFFICIAL PROPOSALS

Bids: July 14, 1950 (7782)

Pumping Equipment

BETHLEHEM, PA.

NOTICE TO BIDDERS

SEWAGE TREATMENT PLANT

CONTRACT NO. 2

Sealed proposals addressed to the Bethlehem Authority at the city of Bethlehem, Pa., for Sewage Pumping Equipment and Appurtenances for Sewage Treatment Plant will be received at the office of the Bethlehem Authority, 25 N. New St., Bethlehem, Pa., until 9:00 A.M., Eastern Standard Time, on the 14th day of July, 1950, at which time and place they will be publicly opened and read.

Proposal specifications, form of contract and bidding blanks are on file and may be obtained at the office of the Bethlehem Authority, 25 N. New St., Bethlehem, Pa., or will be sent by mail upon request. A deposit of $10.00 will be required and will be refunded if the plans are returned in good condition within two weeks of the date set for the opening of bids for the Authority. No refunds will be made after that time.

Each proposal must be accompanied by a certified check, bank cashier's check or bank treasurer's check, drawn to the order of the Bethlehem Authority, Bethlehem, Pa., for an amount equal to 5 per cent of the total amount of the bid submitted. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under the contract, an approved Surety Company Performance Bond in an amount equal to 50 per cent of the bid as security for the faithful performance of the contract, and a Labor and Materials Bond in an amount equal to 50 per cent of the bid as security for the payment of all persons performing labor and furnishing materials in connection with the contract. Bond to be executed by an approved Surety Company authorized to do business in the Commonwealth of Pennsylvania.

No bidder will be permitted to withdraw his bid within 30 days after the date set for the opening of the bids.

The Bethlehem Authority reserves the right to reject any or all proposals or to waive any informality in any bid received and to accept any bid deemed advantageous for the best interests of the City of Bethlehem, Pennsylvania.

Each proposal shall be accompanied by a certified check, bank treasurer's check or cashier's check in an amount equal at least to 5 per cent of the total of the bids submitted, drawn to the order of the Bethlehem Authority, Bethlehem, Pennsylvania. The bidder to whom a contract is awarded will be required to furnish, for the faithful performance of the work under the contract, an approved Surety Company Performance Bond in an amount equal to 50 per cent of the bid as security for the faithful performance of the contract, and a Labor and Materials Bond in an amount equal to 50 per cent of the bid as security for the payment of all persons performing labor and furnishing materials in connection with the contract. Bond to be executed by an approved Surety Company authorized to do business in the Commonwealth of Pennsylvania.

Bethlehem Authority
Bethlehem, Pennsylvania
By: W. R. COYLE, CHAIRMAN
ROBERT L. FOX, Executive Director

U. S. Government

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS, post office box 60267, New Orleans, La., until and will be received in the office until 10 A.M., C.S.T., July 11, 1950, and then opened for the construction of approximately 6 miles of levee, Mississippi River, The principal items involved are: approximately 31,000 cu. yds. concrete, including Portland cement, and 315,000 lbs. structural steel; 24,000 lbs. reinforcing steel; and miscellaneous other work including excavation and backfill, drainage, sodding, and installation of 22 sluice gates. Further information on application. (7802)

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P-6815, Engineering News-Record
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SW-6788, Engineering News-Record
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DESIGN ENGINEER, B.S. in C.E., 1948. Two years' experience in design of steel and concrete structures. Desires position with consulting engineers or contractors in Chicago area. Available June 15. PW-6733, Engineering News-Record.

CONSTRUCTION ENGINEER, B.S. in C.E., 1948. Two years' experience in design of steel and concrete structures. Desires position with consulting engineers or contractors in Chicago area. Available June 15. PW-6734, Engineering News-Record.

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Graduate civil engineer-estimator. Eighteen years foreign service Africa, Indies, South America, some domestic, speaks many languages. Heavy construction specialist dams, hydros, power plants. Can offer sound, money saving field supervision as well as qualified management ability.

PW-6702, Engineering News-Record
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P-6206, Engineering News-Record
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CONSTRUCTION MANAGER. Engineering graduate, experienced in industrial, commercial, and heavy construction, including four foreign. Present employment, Assistant Vice President. Desires connection with firm where ability and training will be utilized to best advantage. Will relocate. PW-6736, Engineering News-Record.

CONSTRUCTION MANAGER. Engineering graduate, experienced in industrial, commercial, and heavy construction, including four foreign. Present employment, Assistant Vice President. Desires connection with firm where ability and training will be utilized to best advantage. Will relocate. PW-6737, Engineering News-Record.

CONSTRUCTION ENGINEER—10 years experience in design, estimating, and supervision of construction of steel and concrete structures. Desires position with consulting engineers or contractors in Chicago area. Available June 1. PW-6738, Engineering News-Record.

CONSTRUCTION ENGINEER—10 years experience in design, estimating, and supervision of construction of steel and concrete structures. Desires position with consulting engineers or contractors in Chicago area. Available June 1. PW-6739, Engineering News-Record.

CONSTRUCTION ENGINEER—10 years experience in design, estimating, and supervision of construction of steel and concrete structures. Desires position with consulting engineers or contractors in Chicago area. Available June 1. PW-6740, Engineering News-Record.

ANNAPOLIS GRADUATE, 29, married, one child. Seven years Naval experience, Master Mariner's license, 6 months in Engineering Department of Naval Vessel. E.E. plus basic Naval engineering courses. Desires position with engineering concern in Chicago area. Available July 15. PW-6741, Engineering News-Record.

(Continued on the opposite page)

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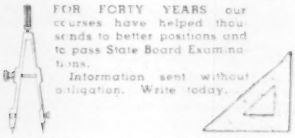

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(Continued from the opposite page)

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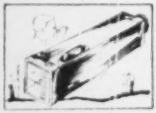

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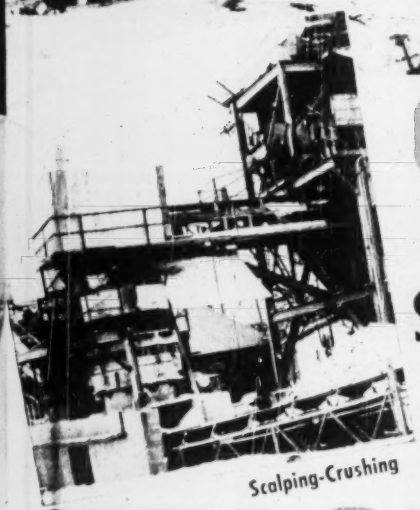
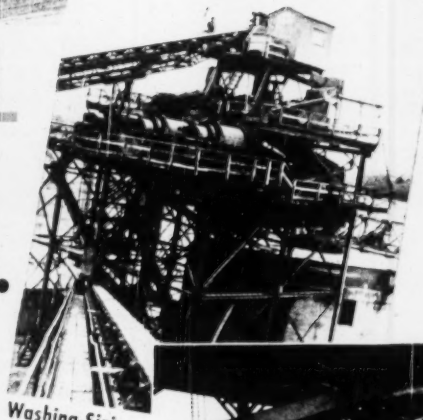
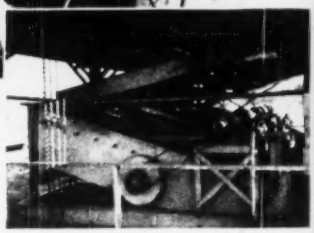


Scalping-Crushing



Washing-Sizing



TELSMITH Equipment in this Plant

Two 5′ x 14′ Two-Deck Pulsator Scalping Screens

Two 48″ Gyrasphere Crushers

Eight 4′ x 10′ One-Deck Vibro-King Dry Screens

Three 4′ x 14′ Two-Deck Vibro-King Wet Screens

Three 60″ x 9′ Super Scrubbers

Six 4′ x 12′ One-Deck Vibro-King Wet Screens

Nineteen 24″ x 15″ Special Tunnel Gates

Fourteen Field and Plant Conveyors—18″, 24″, 36″, 42″ wide; total length about 3000′

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Production averages about 600 cu. yds. per hr., making four kinds of material: minus $1\frac{1}{4}$″ plus $\frac{1}{4}$″ crushed and uncrushed gravel mixed; minus $\frac{1}{4}$″ plus $\frac{1}{8}$″ grits; minus $\frac{1}{8}$″ sand, all washed; and minus $\frac{1}{8}$″ dry sand. Most of the material is loaded into barges for shipment to New York. A truck-loading plant handles local demands.

In Scalping-Crushing Unit, two 2-deck Pulsators are in closed circuit with two 48″ Gyrasphere Crushers which reduce all gravel to minus $1\frac{1}{4}$″. In the Dry Screening Plant eight special Vibro-King Dry Screens produce the dry sand. Washing-Sizing Unit has two batteries of Vibro-King Screens—two-deckers ahead, with single-deckers following the Super Scrubbers. Get Bulletin 266 describing Telsmith Complete Plant Service.

G-18

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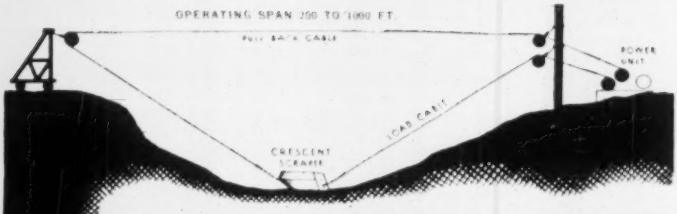

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Sauerman Scraper is good tool for stockpiling as well as for reclaiming. Picture shows a small Sauerman unit that stores and reclaims aggregate at crushing plant.

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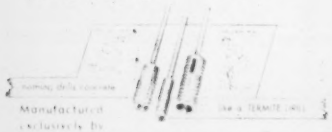

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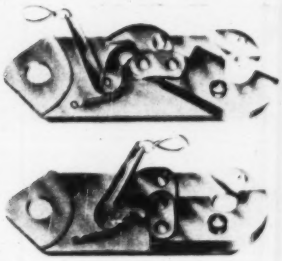
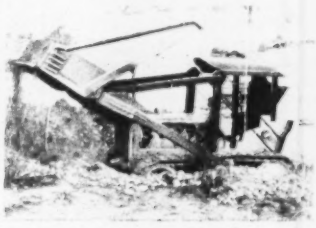
non-clogging water circulation. The Scooter Model uses 1⅝-in. hollow boring bits in sectional lengths up to 10 ft. Drill stem assembly is withdrawn from bore under air-winch power. Unit drills 2 and 2¼-in. holes.—HYDRAULIC CORP., LTD., 681 MARKET ST., SAN FRANCISCO, CALIF.



Safety-Drop Hook

Pull of 40 lb causes this safety drop hook to release a 3-ton load. When released, jaws automatically remain in open position for easy reloading. An important feature is virtual elimination of drag on jaw of hook or object being released. Side plates are of special aluminum alloy; the load-bearing hook, internal cams, and levers are made of high tensile steel.—COFFING HOIST CO., DANVILLE, ILL.



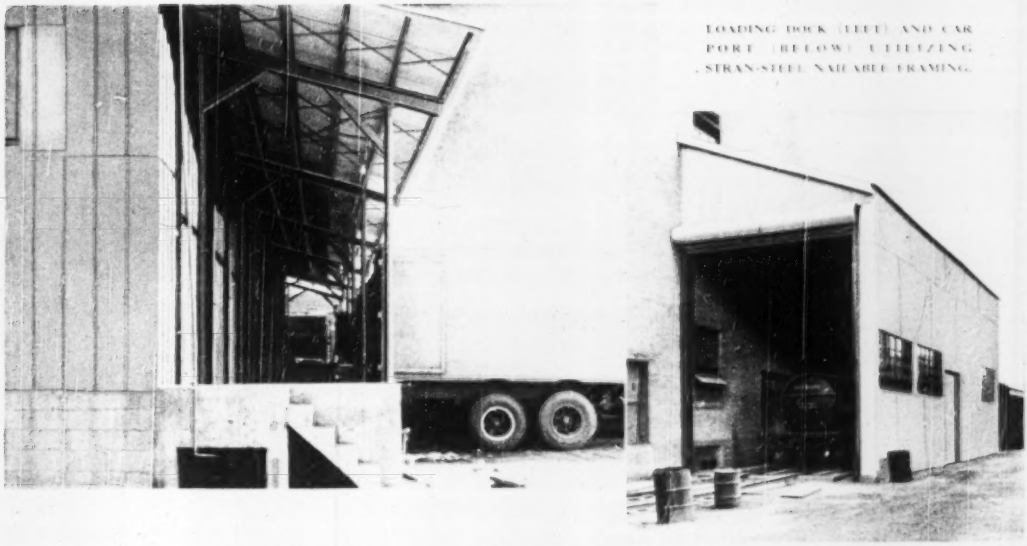
Small Overshot Loader

Recent addition to line of Overshot loaders is the Model 4-C for mounting on utility size tractors including the Caterpillar D-4, Allis-Chalmers HD-5 and International TD-9. The loader has a rated capacity of 1 cu yd and a 20-sec loading cycle. Overshot action eliminates swing and blocking. The Model 4-C is made in two heights for surface operation and for tunneling. Standard unit has an overall height of 13 ft 3 in. with bucket raised and a dumping clearance of 8 ft. Underground unit has an overall height of 12 ft with bucket raised, and a dumping clearance of 6 ft.—JAMES AUSTIN, INC., DENVER, COLO.

Aluminum-Foil Roofing

Lightweight roofing material that has aluminum foil between cotton gauze is said to have high reflectivity, durability, and ease of application. It comes in rolls 36 in. wide and 108 ft long.

Continued on page 114



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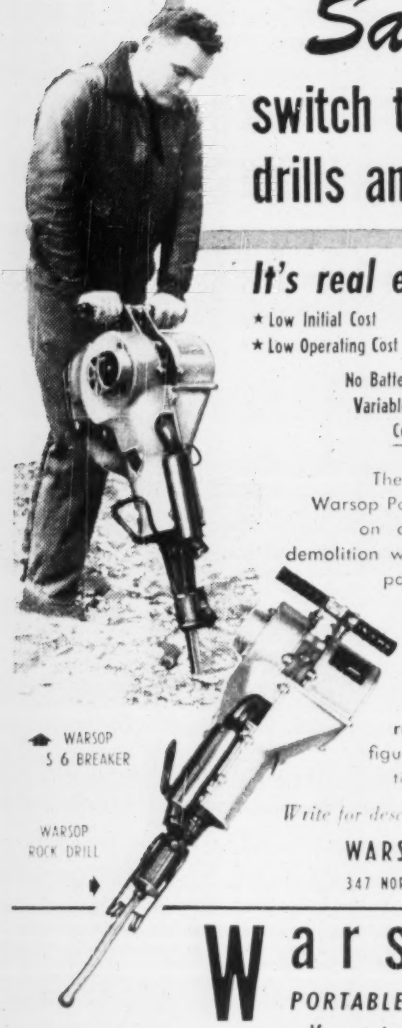

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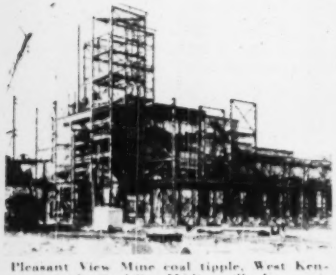

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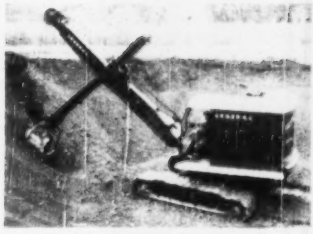
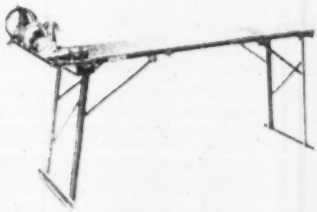


One-Yard Excavator

Air-controlled excavator and material handler has 1-yd capacity. The Model 420 features air control of all major motions including swinging, hoisting, steering, boom-hoist trip and down, swing brake, shovel crowd and retract, and shovel dipper trip. Independent travel and independent boom-hoist are featured as standard equipment on the 420. Machinery is placed on the deck so that good balance is obtained, and the need for a large amount of counterweight is eliminated. The Model 420 is offered as a shovel, dragline, clamshell, lifting crane, hoe, pile driver, magnet crane, and for other classes of service. Diesel or gasoline power is available.—GENERAL EXCAVATOR CO., MARION, OHIO.



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Collapsible saw table folds into a size small enough to fit into a car trunk. It permits using a power hand saw for rip, crosscut, mitering, and other standard types of cuts. Fence guide on end of table is adjustable to fit shoe of any saw. The table is 84 in. long, 30 in. wide, 34 in. tall, and weighs 75 lb.—SALES SERVICE MACHINE TOOL CO., 2565 UNIVERSITY AVE., ST. PAUL 4, MINN.

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(Continued on page 116)

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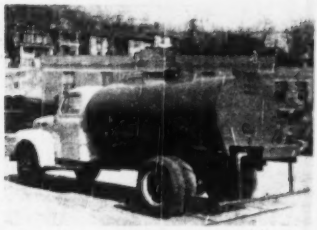

Water-Sprinkler Tanks

Gravity and pressure-type sprinkler tanks are recommended for soil stabilization, dust control, weed control, and other water-hauling requirements. The Littleford tanks can be skid, truck, or 4-wheel trailer mounted, and are available in capacities from 500 to 1,500 gal. Large manholes simplify filling. Spray bars are designed so that they are easily removed. The bars can be provided with shifting and end folding features.—LITTLEFORD BROS., INC., 415 E. PEARL ST., CINCINNATI 2, OHIO.

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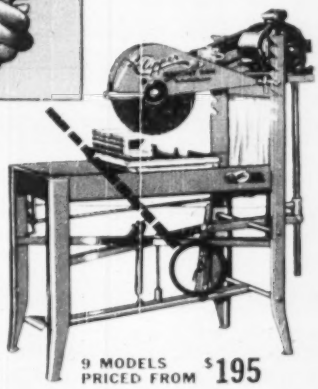

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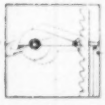

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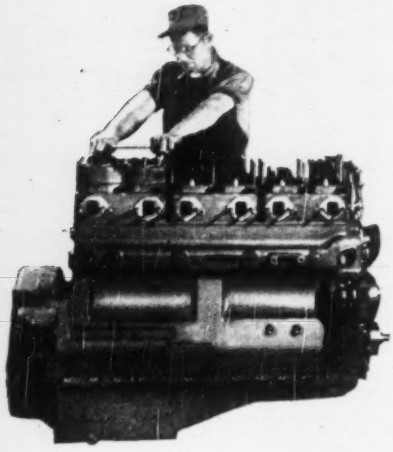

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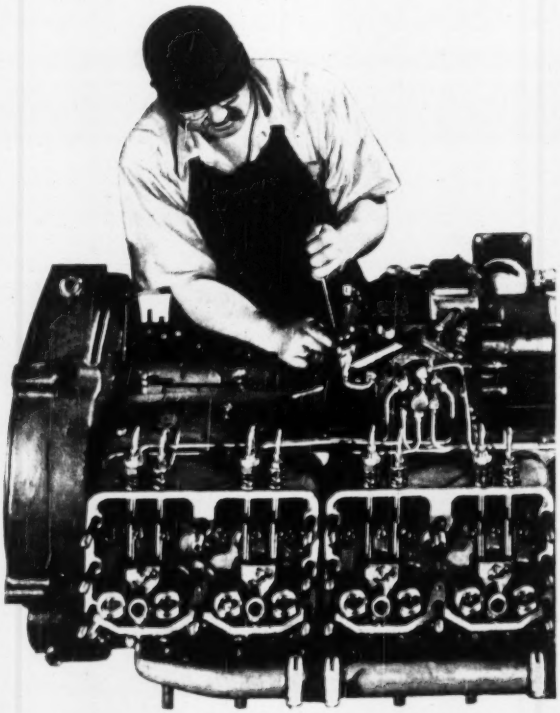

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Manufacturers' Publications

Lighting Specifications. Newly revised edition of IES Specification Booklet [illegible] pages, contains four officially approved new specifications, as well as important revisions of existing specifications. Details are provided for [illegible] different fluorescent and incandescent industrial lighting [illegible] from [illegible] IES Standards Institute, 51 W. Madison St., Chicago 2, Ill.

Liquid Shock Absorbers. One-page data sheet contains information on the Hydrolastic liquid shock absorbers and explains principles. The sheet lists several of the many [illegible] applications and briefly explains how the units work. Request Bulletin [illegible] from Metalastik Ltd., Leeds, England.

Automotive Winch. Model [illegible] winch for [illegible] is described in Bulletin [illegible] pages, single fold. The winch is for [illegible] and is [illegible] the [illegible] gear reduction unit. The data sheet lists [illegible] and [illegible] Request Bulletin [illegible] from Engineering Products Co., [illegible] Ave., Cleveland 3, Ohio.

British-Made Excavators. Four-page bulletin has been published describing the Ransome excavators. Bulletin [illegible] pages, describes features of construction and operation of the Ransome walking dragline. Bulletin [illegible] pages, describes the Model [illegible] crawler-mounted shovel. Ransomes & Rapier, Ltd., Waterside Works, Ipswich, England.

Drafting Machines. Instruction booklet [illegible] pages describing use of Vemco drafting machines. The [illegible] pages explain the underlying principles of standard machines. There is followed by a section on [illegible] special [illegible] Another section covers care of the [illegible] engineering [illegible] A. & E. Mfg. Co., [illegible] S. Lake Ave., Pasadena 2, Calif.

Treated Wood. Two pamphlets on treated wood are now available. One, [illegible] pages of information, [illegible] the advantages of [illegible] with chromated zinc chloride to [illegible] the attack of decay fungi, wood-boring insects and [illegible] Continued on next page

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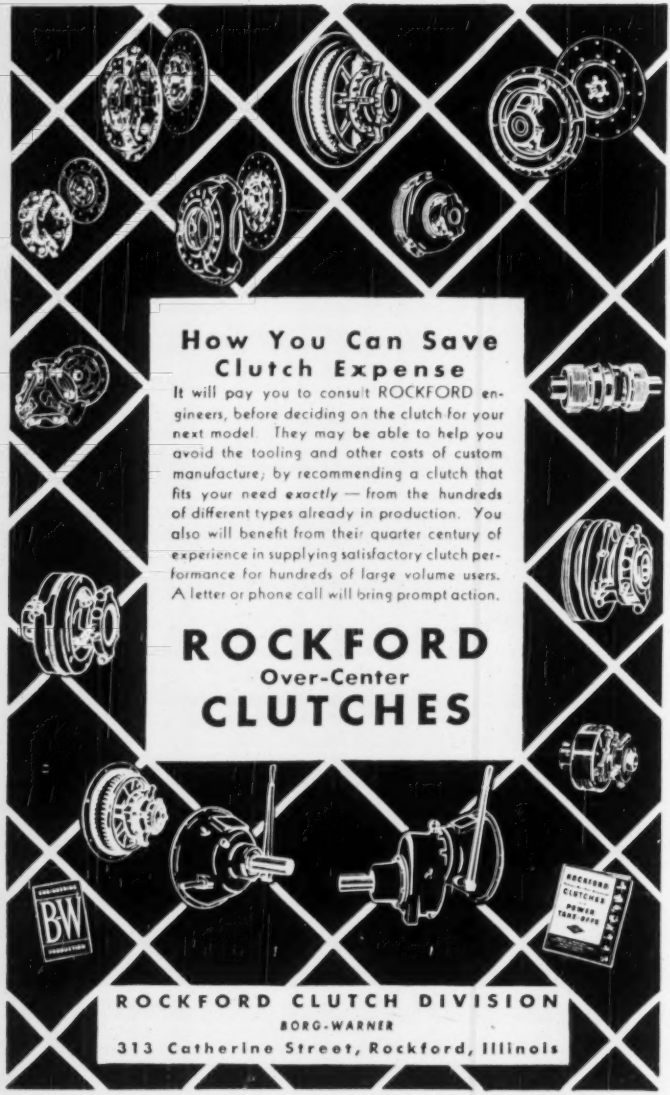
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sive moisture or lack of moisture. The guide covers five types of treatment. The other booklet, entitled "Before You Build or Buy", is pointed toward those dealing with house building. It contains pertinent information on the correct use of pentachlorophenol in protecting the wooden parts of buildings. — The Dow Chemical Co., Midland, Mich.

Foundation Columns — Anchored-in-rock-socket foundations are the feature of this 8-page. The bulletin describes this type of Drilled-in Caisson, lists its principal features, describes its installation, and lists suggested specifications. Engineering information covers test and design data for determining capacities of Drilled-in Caissons. — Drilled-In Caisson Corp., 2 Park Ave., New York 16, N. Y.

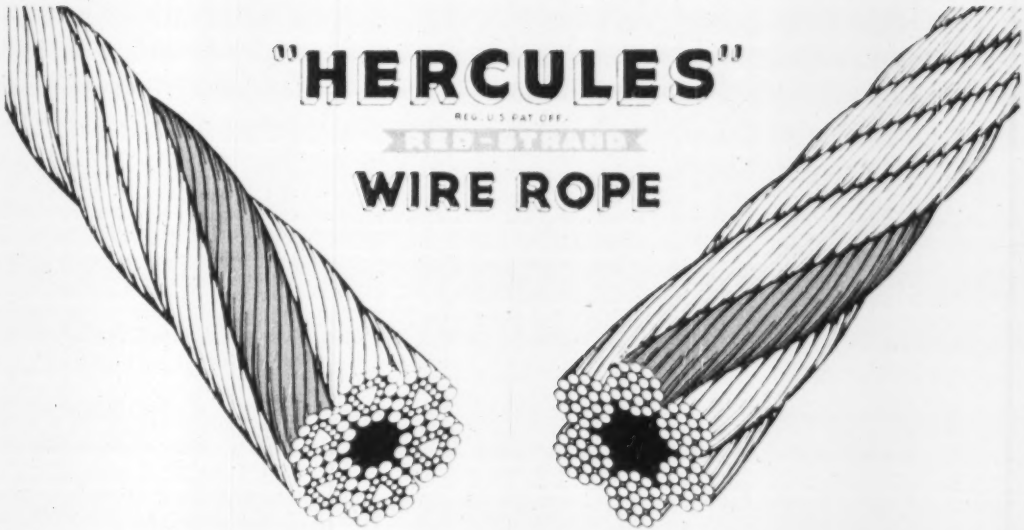
Pump Catalog — Three types of pumps are described in catalogs published recently. Catalog I-748 describes sump pumps in capacities from 50 to 150 gpm; Catalog I-1049, mixed flow volute-type pumps; and Catalog I-249, non-clogging centrifugal pumps in a capacity range from 50 to 20,000 gpm. — Economy Pumps, Inc., Hamilton, Ohio.

Power Tools — Catalog (36 pp) describes power tools for wood, metal, and plastics. Included are band saws, radial and tilting arbor saws, drill presses, jointers, lathes and shapers, sanders, surfacers, and flexible-shaft machines. Specifications and operating conditions for each machine are listed. — Walker-Turner Div., Kearney & Trecker Corp., Plainfield, N. J.

Mechanical, Hydraulic Jacks — Specifications and application information on all sizes and types of mechanical and hydraulic jacks are included in 32-p Catalog 50. This letter-size catalog carries full details of the 128 models of ratchet lowering, hydraulic and screw-type jacks that comprise the Standard Simplex line. — Templeton, Kenly & Co., 1020 S. Central Ave., Chicago 44, Ill.

Hard Surfacing — Two bulletins now available describe repair of construction equipment by welding. One discusses Stoody-made hard-surfacing electrodes for protecting parts subject to severe impact and abrasion. Uses listed include repair of cutter parts, shovel teeth and lips, bulldozer blades, tractor grousers, clamshell bucket lips, and pumpshells and impellers. The other bulletin describes rebuilding and repairing worn buckets with Mangotec

(Continued on page 122)



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Plywood-Magnesium Forms—Booklet (34 pp.) describes plywood forms in magnesium frames. Features of this type of form are listed, as are the sizes in which they are available. Accessories for use with the forms are also given, feature treatment.—SYMONS CLAMP & MFG. CO., 4265 W. DIVERSEY AVE., CHICAGO 39, ILL.

Planned Parking Facility—Construction and operation of a new type parking center is described and illustrated in this 8-p catalog. The Helix Duplex Motor Park features efficient operation, simplicity of layout, and adaptability. The catalog discusses the theory of the Motor Park, explains parking and evacuation, engineering and construction, operating expenses, parking fees, and other pertinent factors. Dimensions and capacities are listed for several size units.—ST. ALBANS ENGINEERS, ST. ALBANS, W. VA.

Air Tools—Bulletin SCI-50 describes the complete line of 1950 Schramm Golden Anniversary tools. Included are rock drills, the WDR-126 wagon drill, paving breakers, clay spades, trench diggers, backfill and tie tampers, chain saws, vibrators, air hose, and all necessary accessories. The bulletin illustrates each tool and contains complete specifications and recommended applications.—SCHRAMM, INC., WEST CHESTER, PA.

Bascule Gates—Working parts and general operating features of the Smith bascule gate are described and illustrated in Bulletin 153 (12 pp.). These gates are designed particularly for service in pond level and flood control applications. The bulletin contains several photographs showing the gates in use, and shop views indicating their construction. Also listed is other equipment produced by the company.—S. MORGAN SMITH CO., YORK, PA.

Brick and Tile Construction—The Structural Clay Products Institute has inaugurated a monthly information service to further better masonry structures. The first four issues cover cold-weather masonry construction, efflorescence, construction of watertight masonry walls, and painting brick and tile walls.—STRUCTURAL CLAY PRODUCTS INSTITUTE, 1520 EIGHTEENTH ST., N. W., WASHINGTON 6, D. C.

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Letter from **HOUSTON**

The construction industry of Houston, Tex., is feeling good this spring. Stability exists in labor relations that have been other than peaceful since the war, and business is brisk (with overtones of fierce competition).

Newspapers throughout the nation noted the former fact when on March 28, twenty-three Houston AFL building and construction unions, together with 329 contractors, announced their agreement "... to settle wage disputes without arbitrary recourse to strikes or lockouts." This was good news to a city that had suffered four major construction strikes in 1949. Under the treaty, no union may ask for a wage adjustment without approval by two-thirds of the signatory unions. Three-fourths of the unions have to approve a proposed strike. The agreement runs through June 30, 1951 and is renewable on a year-to-year basis.

The agency for the contractors is the Gulf Coast Construction Employers Council, of which general contractor Harold Van Buskirk is president and Joe J. Brady is executive secretary.

The tabulation agreement seems to indicate that union labor is satisfied with conditions in Houston. (Wages are similar to those in other Gulf Coast cities.)

Boosters say the unions are satisfied because the men are certain of steady work in ever-growing Houston. Productivity also is good. Coy Duddlesten, executive secretary of the Houston chapter, AGC, points out that bricklayers lay 500 to 1,000 bricks daily now—about double what they put down a year and a half ago.

• **Publicity man figures**—The rosy construction labor picture may be due to the excellent publicity Houston's growing future continues to get in America's press. This publicity attracts labor of all kinds (particularly in the fall and winter). Public relations is an essential part of most activities, from the Chamber of Commerce down to many small business organizations, and including construction firms.

Construction's importance is underestimated by no one. Every excavation, every quietly growing steel frame (they're all welded here) is an object of pride for the man on the street. To him each project reaffirms his faith in a never-dimming opportunity to work and live in Houston.

• **Big contractor runs open shop**—Houston's labor picture may be influenced by another feature—one that appeals to the construction man who is accustomed to the virtual labor monopoly of building trades unions in many parts of the country. Brown and Root, Inc., a world-wide contracting firm and one of the most important factors in the otherwise organized local construction business, is strictly open-shop. The firm does it by paying better than union scale, training its own forces and maintaining a volume of work that will assure continuous employment for trained workers. Moreover, the firm sticks to heavy construction, which means limited contact with the older, more highly organized trades. Locally, Brown and Root is building a big stadium for Rice Institute. The firm took the job on a tight schedule, for completion in time for the 1950 football season, and there's no worry about meeting the date. An AFL man picketed the gate, but men and materials pass regularly. One favorable factor is incomplete teamsters union organization in Houston.

Opinions vary as to the effect on Houston construction of Brown and Root's non-unionism. It's all a matter of high principle with Herman Brown, and construction men have no doubt that the firm would quit the construction business rather than cede to dictation by unions. (Brown and Root is said to have diverse parts—a salvage business, real estate interests, a long-distance gas pipeline and a big dude ranch, to name a few.)

AGC's secretary Duddlesten thinks the presence of a large and successful open-shop contractor definitely checks undue wage increases in Houston, and therefore is good for business. Duddlesten is in close touch with the overall construction labor situation because his chapter is bargaining agent for 91 general contractors in their relations with several unions. Naturally, the chapter is an important participant in the Construction Employers Council.

• **AGC gives maximum service**—Incidentally, the Houston chapter performs some highly effective services for its members. It publishes a semi-weekly tabloid whose most important feature is a series of items entitled "Project Information." Each item describes an impending job and lists contractors who already have submitted bids. A front-page feature, "On File in the AGC Plan Rooms," informs members of jobs they can figure from plans at the headquarters. The service also is available to 550 mechanical trades subcontractors, who are associate members of the chapter. When an associate comes in to take off a job, the fact is noted in a card file. Then any general contractor who is looking for subcontract bids on a given project can look in the file to find out from whom he can expect a quick price. Duddlesten calls this the Houston Plan; he says that several other chapters have adopted it.

• **Competition keen**—Right now the AGC plan room is a mighty lively place. Despite a high construction volume, the contractors are scrambling for work. Perhaps this is because labor, machines and materials are easier to get than they were a year and more ago, so individual contractors feel they can take more work. Perhaps they're scrambling because some contractors are over-equipped, and are willing to take jobs non-cost in order to pay for the machines.

Whatever the reason, in the words of veteran Houston contractor W. S. Bellows, "The competition is separating the men from the boys." AGC headquarters doesn't seem to be worried for its members. "They are the men," Duddlesten says. This is probably true—at least we were unable to learn of any chapter member who has gone out of business. On the other hand, a couple of well-known out-of-town contractors are reported to have closed their Houston offices. And another has taken no business in a year rather than work at a loss.

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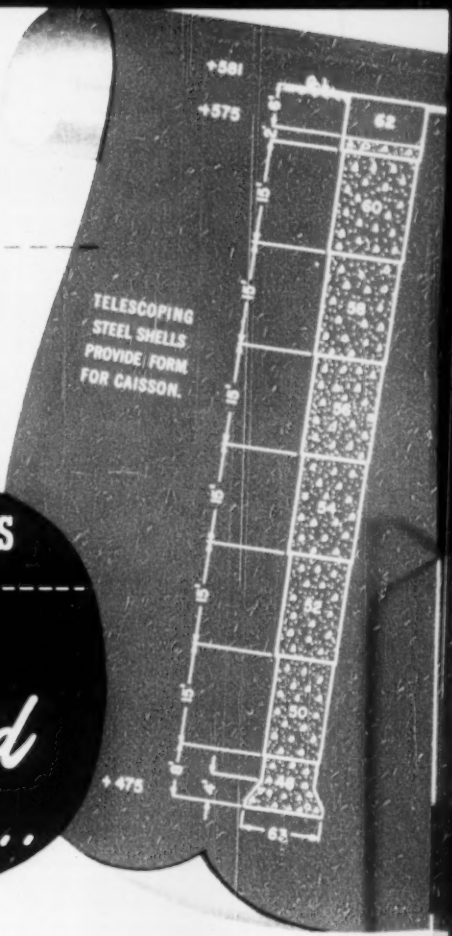

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